

Coal Age

MARCH, 1952

A McGRAW-HILL PUBLICATION — PRICE 50c

Trackmounted Shuttle Cars

Mine - designed track car boosts loader time. A special "New Methods Report." p 80

Fighting Mine Fire By Flooding

How skilled planning and strict control cut ravages of anthracite fire. p 96



CAN CONGRESS MAKE MINES SAFE?



COULD ONE STRAW BREAK THE BACK OF YOUR COAL HAULING SYSTEM?

Only with "constant haulage" mine cars can you eliminate the danger of a complete transportation breakdown! For when a mine car needs repairs, it is immediately switched to a siding...usually repaired on the spot by your own maintenance men. The rest of your coal continues to roll! And with Q.C.F. mine cars you move men and supplies *into* the mine with the *same* transportation system you use to move coal *out*—saving *more* time and money!

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a.c.f. MINE CARS
for Constant Haulage

Only with B. F. Goodrich grommet belts can you make these savings!

*Save 3 ways! Investigate today!
Write or mail coupon*

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord section as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of

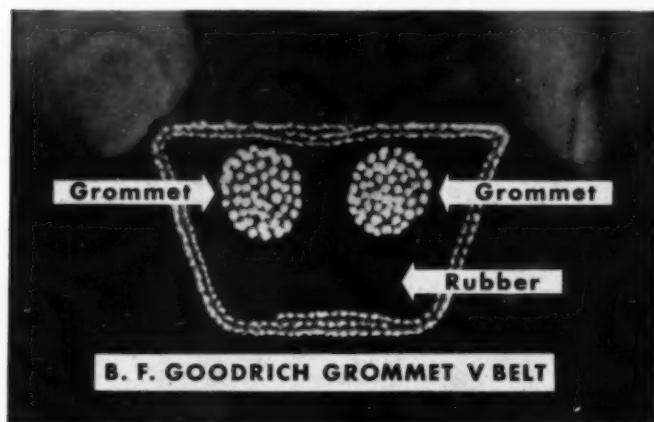
the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give $\frac{1}{2}$ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:



"...within a few days ordinary belts had stretched . . . After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all . . ."

"Ordinary belts lasted only 5 or 6 weeks . . . B. F. Goodrich grommet belts are in their sixth month of service . . ."

"Previous belts suffered from shock loads, wore out fast . . . BFG grommet belts have been in service 2 years with no shut-downs . . ."

There are hundreds of cases like these.

They cost no more

BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V Belts BY
B.F. Goodrich
FIRST IN RUBBER

The B. F. Goodrich Company
Dept. CA-3
Akron, Ohio

Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.
 Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name _____

Firm Name _____

Street Address _____

City _____

State _____

Outstanding because Successfully meeting



The tiger's stripes, merging with the jungle, enable him to stalk his prey by concealing his presence. Nature blends his coloring to meet specific conditions.

HULBURT OIL & GREASE COMPANY
PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

specific conditions

*Just
Like*



Hulburst *Quality* **GREASE**

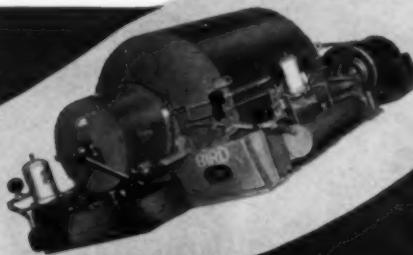
Hulburst Quality Grease meets the most difficult conditions in successful lubricating coal mining machinery because it, too, is specifically made for such conditions. We don't make Hulburst Grease for anything but lubricating coal mining machinery.

But we do make it to do that one job and do it supremely well—and that's why Hulburst is the first choice of coal mining men of long experience. Lost in the jungle of competing claims? The proven way out is Hulburst.

TWO BIG STEPS TOWARD BETTER, LOW COST COAL PREPARATION

STEP ONE:

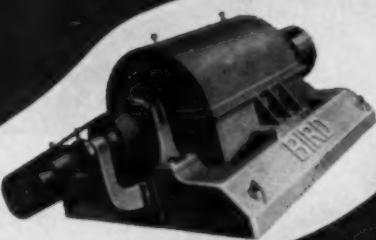
GET THE
WASHED FINE
COAL Dry



The Bird Coal Filter dewateres 1% and finer coal better than any other known method. It handles ton of coal (as much as a ton a minute) at low cost (\$1.50 a ton for operation, 2 cents or less per ton for maintenance).

STEP TWO:

GET THE
WATER
Clean



This Bird Dewatering and Clarifying System delivers clean water for reuse as desired. No water ever needs to leave the system. There's no longer a disposal problem.

For the complete story on why more than twenty million tons of fine coal have been successfully and economically dewatered by Bird Coal Filters, get in touch with

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

Coal Age



FEDERAL AUTHORITY to close mines generates strong arguments on both sides. But the important question is: "Will Mines Be Safer?" For the inside story of what miners themselves, federal and state inspectors and company officials really think, see "Safer Mines . . . Can Congress Do the Job?" beginning on p 70. Be sure, also, to read comments on Coal Age's four-point program for better mine safety included in this article.

(Wide World photo)

WATCH COAL AGE

. . . For mine-tested experience, new ideas and unusual developments on your everyday mine problems. Among the many helpful articles slated for April and other early issues of *Coal Age* you'll find:

Design for Full-Seam Mining—New West Virginia mine and plant improvements built for top operating results, with portal located to take full advantage of terrain.

How Radio Speeds Stripping—Installation at three Ohio pits 20 mi apart cuts breakdown delays and aids management control.

Efficient Three-Product Washing—Installation and results with a new-type classifier at a modern new West Virginia plant.

Underground Maintenance Shop—Specially designed shop at bottom of 600-ft shaft stresses effective maintenance, with ample working space and good facilities.

Large-Scale Anthracite Stripping—Shovels, large trucks and chisel drills team up for better bench stripping.

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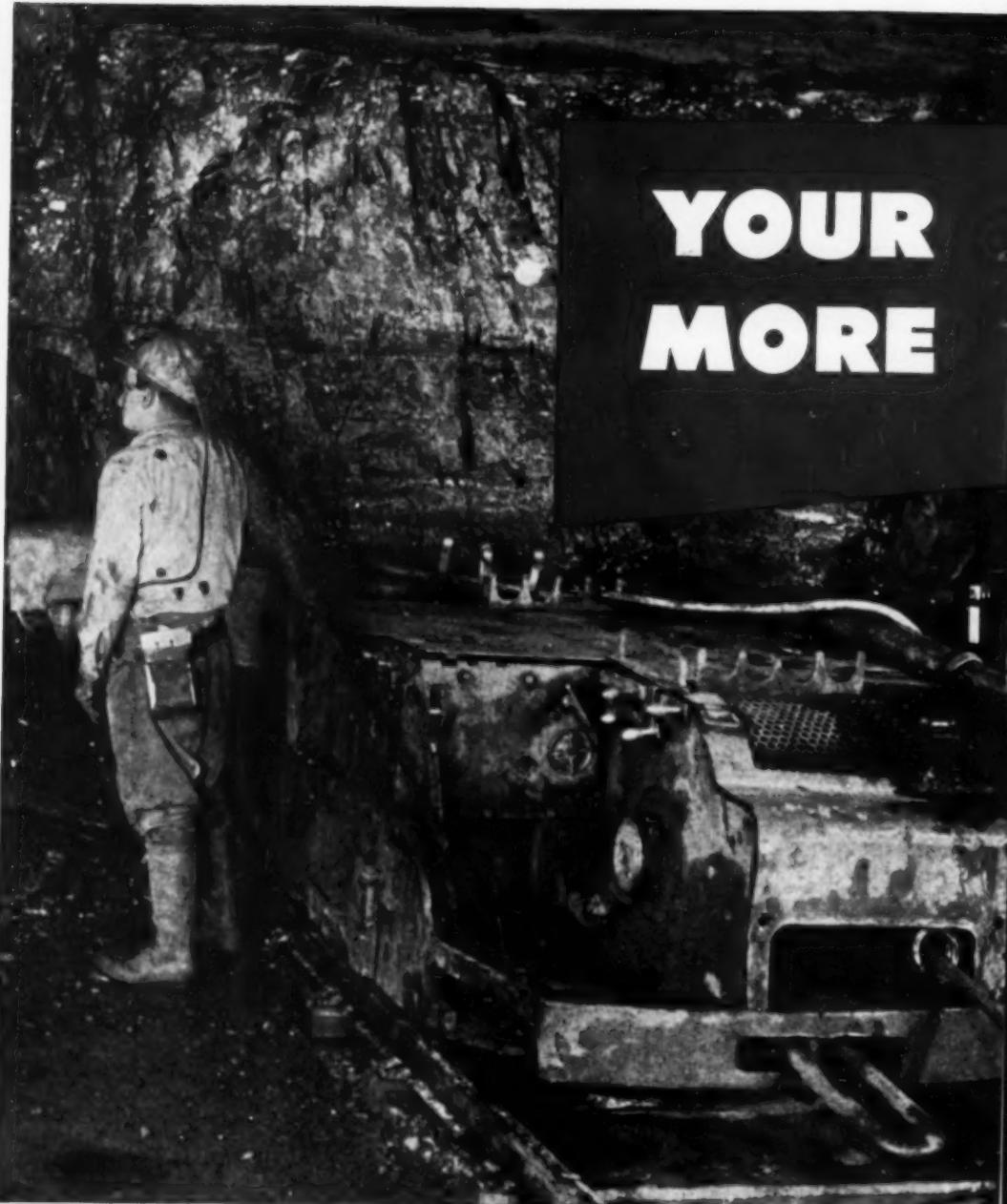
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MORE**

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STAR THEATER
starring MILTON BERLE
on television
every Tuesday night.
METROPOLITAN OPERA
radio broadcasts every
Saturday afternoon.



TEXACO LUBRICANTS

Photo Courtesy Jeffrey Mfg. Co.

CUTTERS CAN CUT COAL . . .

**when hydraulic mechanisms
are protected with
TEXACO REGAL OIL (R&O)**

There's no need for the sudden production stoppages that occur when an improper oil fouls a hydraulic mechanism. Wherever equipment is hydraulically operated or controlled — in cutters, loaders, shovels and other equipment above and below ground — use *Texaco Regal Oil (R & O)*.

Texaco Regal Oil (R & O) is the turbine-quality hydraulic oil that has *more than ten times the oxidation resistance* of oils of similar grade. It won't sludge, won't foam, won't let rust form. It keeps hydraulic operation smooth and dependable...reduces wear and maintenance costs. There is a complete line of *Texaco Regal Oils (R & O)* — viscosities

for every hydraulic job. No "cutting back" is necessary.

IN MINE CAR WHEELS use *Texaco Olympian Grease*. It assures easier starts at all temperatures, stays in the bearings — plain, cavity hub or anti-friction — gives longer lasting protection and smoother operation.

A Texaco Lubrication Engineer will gladly work with you to improve the operating efficiency of all your machinery. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

★ ★ ★
The Texas Company, 135 East 42nd Street,
New York 17, N. Y.

For the Coal Mining Industry



now - a Tractor Shovel ... Powerful

WORLD'S LARGEST FRONT-END SHOVEL

— Allis-Chalmers HD-20G with Tractomotive. 4 cu. yd.
Standard Tracto-Shovel. Also available — 7 cu. yd.
light materials bucket.



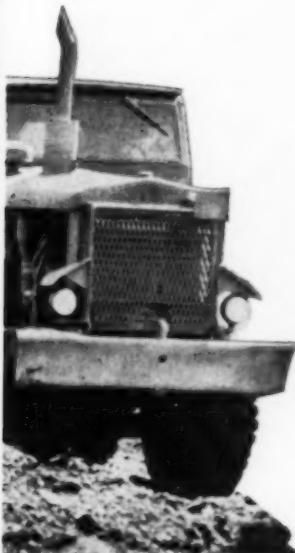
At Tecumseh Coal Corp., Boonville, Indiana, this big Allis-Chalmers tractor shovel keeps producing three shifts every day, six days a week. Loads about 30 wagons a shift (40 tons per wagon) . . . also keeps pit clean, among other jobs.

THERE'S A **RIGHT MACHINE FOR EVERY NEED IN**

Bulldozing HD-20, with bulldozer blade, prepares a roadway into pit for stripping. As a dozer, this versatile tractor also builds haul roads, pushes material into reach of strippers, moves and levels spoil banks, strips hillsides seams.



with Big Loading Capacity Excavating Ability ... Real Versatility



A HIGHLY PRODUCTIVE MACHINE EVERY MINUTE
OF THE DAY . . . AT NEW LOW COST PER TON!

The HD-20G will be here, there, everywhere on your operation . . . saving money on different jobs, because it's versatile and powerful, fast maneuvering and fast traveling, big in capacity.

A powerful, rugged excavator — quickly digs and loads toughest materials, including shale and clay.

Loads coal right from the pit — out of some seams without blasting. Torque converter drive keeps bucket crowding constantly as it digs . . . no engine stalls.

Builds access roads, constructs ramps into pit for stripping shovels and trucks, loads from stockpiles — handles most digging, loading, leveling.

Prove to yourself that this outstanding combination can make more money for you. Ask your Allis-Chalmers industrial tractor dealer for all the facts.

The Newest, Finest Tractor Line on Earth

Stripping — on a large scale — is another everyday job handled by the powerful HD-20. On both pushing and pulling operations, this tractor's torque converter drive balances speed and load for maximum output at all times.



HD-5

40.26 drawbar hp.
11,250 lb.

HD-9

72 drawbar hp.
18,800 lb.

HD-15

109 drawbar hp.
27,850 lb.

HD-20

Hydraulic Torque
Converter Drive
175 net engine hp.,
41,000 lb.

Each of the Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each sets new standards in its class for performance, strength, servicing, operation. In addition, a complete new line of Allied equipment makes

it possible for you to handle a wider variety of jobs faster, easier and at lower cost. For all the facts on any of these tractors, see your Allis-Chalmers dealer.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

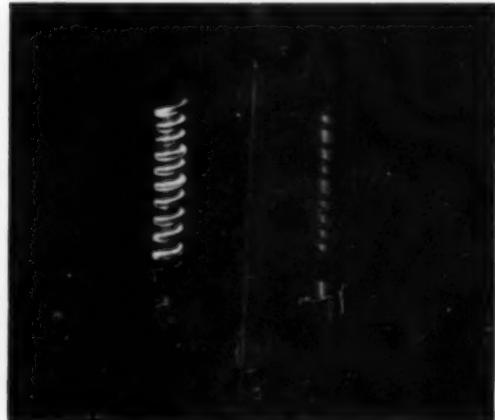
the spike test proves it!



PS Shielding*



American PS Shielded Cables are perfect for aerial lines. Tree trimming is practically eliminated. Corona troubles vanish . . . along with television and radio interference.



Here's a good example of the way PS Shielding prevents corona formation. The conductor on the left is insulated with unshielded "ozone-proof" rubber. But the PS Shielded Cable on the right is completely free from corona.



PS Shielding is so flexible, light and small that it is easy to manhandle over support rigs in the most rugged country.



PS Shielding provides an extra margin of safety when cable must be dragged over sharp rock and when it must be handled by workers.

UNITED STATES STEEL

by itself is a safety measure

*an original development of American Steel & Wire Division



● There's an easy way to prove the effectiveness of PS Shielding. Just drive a spike through the PS conducting rubber tape into the copper conductor *without touching the ground wires*. Your breakers will trip every time, proving that PS Shielding *alone* is an outstanding safety measure for the protection of all who handle your cable.

Naturally, the PS grounded tapes can't carry heavy currents, so they're usually used in combination with ground wires. But PS Shielding will easily handle the circumferential current of the cable. In other words, it will do everything that metallic shielding will do *with these added advantages*:

Prevents Corona Discharge —PS Shielding is so flexible that it never pulls away from the insulation. This is in sharp contrast to metallic shielding which often separates from the insulation when the cable is bent. Each of the resulting gaps is a serious danger point since it may cause spark discharge plus the inevitable corona and ozone formation.

Easy to Splice —PS Shielding is available in rolls. For most splices you can apply your shielding to the splice just like ordinary insulating tape.

Reduces Bulk —PS Shielding has less bulk and weight than metallic shielding. Consequently, the cables are lighter, smaller, and in general—easier to handle.

Increases Cable Life —PS Shielding is so smooth and pliable that it won't chafe the insulation or jacket. There are no fine wires to break when the cable undergoes hard usage.

For the full story on PS Shielded Cables, get in touch with your nearest American Steel & Wire Division office.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY
GENERAL OFFICES, CLEVELAND, OHIO

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S American Electrical Wire & Cable

UNITED STATES STEEL

Forminiere mechanizes



Cleaning the cut, maintaining haul roads, pusher-loading Tournapulls are just a few of the many jobs handled by Tournadozers at this Belgian Congo mine. In addition to these Tournapulls and Tournadozers, Forminiere uses a road-dump 16-ton Tournotruck to haul diamond-bearing gravel.

At BAKWANGA, BELGIAN CONGO,

mining engineers located vast new deposits of industrial diamonds under 30 meters (100 ft.) of sand, clay and loose rock. While the Bakwanga area has for years produced a large portion of the world's industrial diamond supply, older deposits, nearer the surface, had chiefly been uncovered by native hand labor. To remove economically the great depth of overburden on the new findings, the most efficient stripping method was necessary.

Remove 6,000,000 m³ of overburden
with 14 LeTourneau earthmovers

Forminiere, acting for the owners of the Bakwanga Industrial Diamond Mines, carefully considered all types of earthmovers, then bought a fleet of 14 new LeTourneau machines to handle the entire 6,000,000 m³ (7,850,000 cu. yd.) project. Their 9 electric-control Tournapull-Scrapers drove 150 km. (93 miles) from the nearest railroad siding to the mine in 5 hours. Their 5 Tournadozers made the 150-km. trip under their own power in 8 hours.

5 Tournadozers, 9 Tournapulls speed clearing, stripping

Since arriving at Bakwanga, the machines have worked over 2000 hours each, through both rainy

and dry seasons. The 9 high-speed Tournapulls load, haul, and dump overburden. Each of these self-propelled scraper units, driven by a native operator, moves 6 to 7½ loads, 45 to 56 m³ (59 to 73 cu. yds.) of sandy material hourly on a haul cycle of 1600 meters (1 mile).

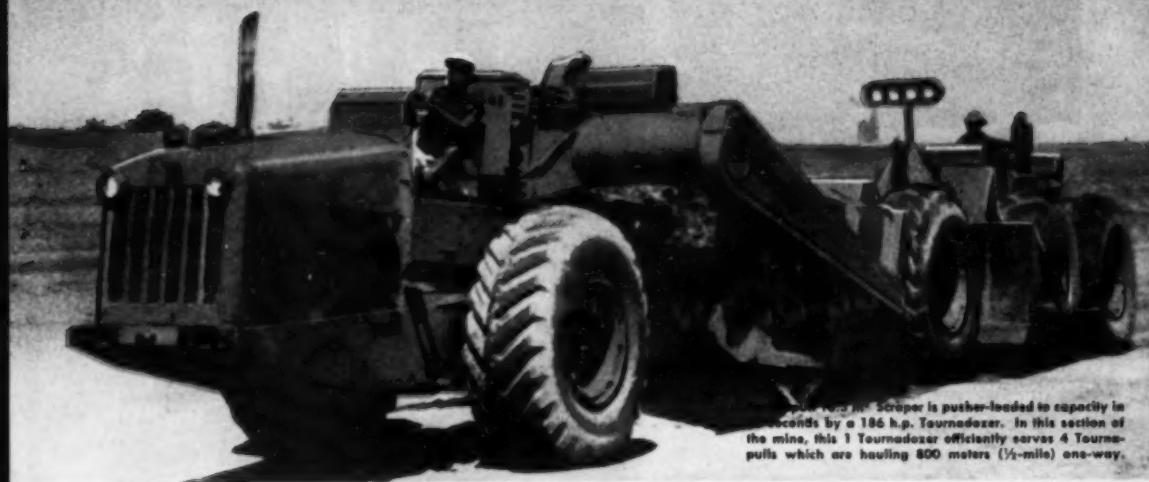
Put work "far ahead of schedule"

The Tournadozers handle all pusher-loading, clear bush grass (often 3 meters, 10 ft., in height), level areas for stripping, and maintain haul roads. One of these versatile bulldozer units is also equipped with a sideboom crane for part-time lifting and repair work. So efficient has been this LeTourneau method that stripping is far ahead of schedule. Forminiere officials say their Tournapulls and Tournadozers move even more earth and at a lower-cost-per-meter than was originally expected.

If you have earth to move, ask your LeTourneau Distributor how these dependable machines can simplify operation, lower costs, and increase your production. He will be glad to help you analyze your equipment requirements or to put you in touch with the owner of the nearest available LeTourneau fleet. He is a good friend to know.

R. G. LeTOURNEAU, INC.
PEORIA, ILLINOIS

its diamond mining methods



Scrubber 10 cu. m.³. Scraper is pusher-loaded to capacity in seconds by a 186 h.p. Tournadozer. In this section of the mine, this 1 Tournadozer efficiently serves 4 Toum-pulls which are hauling 800 meters ($\frac{1}{2}$ -mile) one-way.

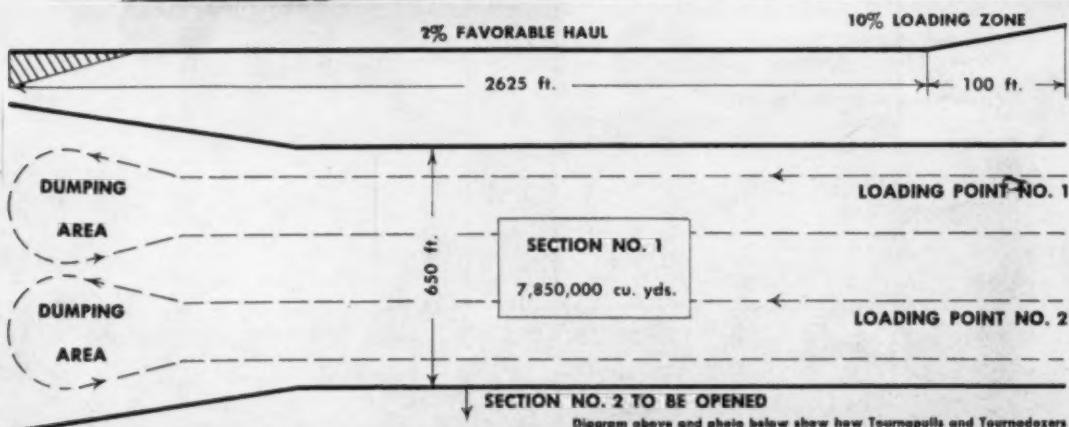
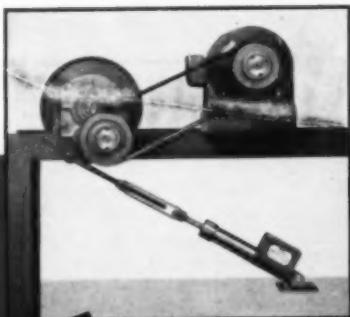
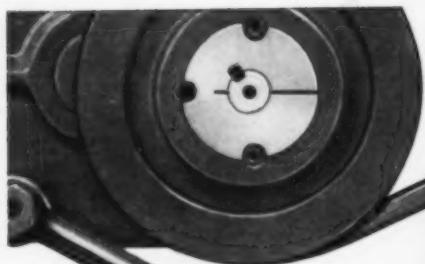


Diagram above and photo below show how Toum-pulls and Tournadozers are stripping overburden at mine section No. 1. This box cut is approximately 800 meters long and 200 meters wide (2625 ft. x 650 ft.). On this work, Toum-pulls travel at speeds up to 56 km./h. (35 m.p.h.).



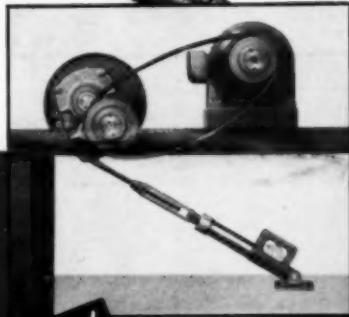
HIGH-SPEED, RUBBER-TIRED HAULING • EXCAVATING • LIFTING EQUIPMENT

LET



SET!

Dodge Tri-Matic Overload Release is held in place by two sets of pins. It is set by turning the lock nut clockwise until the pins are seated in the slots.



TRIPPED!

Dodge Tri-Matic Overload Release is held in place by two sets of pins. It is tripped through the soft operating lever, turning off power, cutting off motion.

Now . . . another great development by Dodge . . . that provides instant and positive protection for driven machines, motors, and the famous Torque-Arm Speed Reducer itself! The new Dodge Tri-Matic Overload Release prevents breakdowns, avoids expensive repairs, insures your production against costly interruptions.

Here's a worthy companion to other Dodge achievements in power transmission machinery, such as Taper-Lock Sheaves, Dodge-Timken Bearings, Rolling Grip and Diamond D Friction Clutches, Dodge Torque-Arm Speed

Reducers, which have brought dependable speed reduction to industry's machines at great savings in cost, are available in two series—Single Reduction and Double Reduction—with capacities from 1 hp to 48 hp, speeds from 15 to 330 rpm.

Write for special data on Torque-Arm Speed Reducers and the new Tri-Matic Overload Release.

SEND FOR TRANSMISSIONS
your free "Dodge Transmission Catalog" mailed by Dodge. It contains valuable assistance on how to select the right type for the exact work. "Power Transmission Simplified" is illustrated where both

DODGE MANUFACTURING CORPORATION, 2000 Dodge St., Milwaukee, Ind.



DODGE

Tri-Matic Overload Release

FOR THE FAMOUS DODGE
TORQUE-ARM SPEED REDUCER

- 1 LOOSENS THE BELTS
- 2 CUTS OFF POWER
- 3 GIVES A WARNING

Protects Your Machines
Mechanically . . Electrically
POSITIVELY!

- The Dodge Tri-Matic Overload Release is a simple, positive acting unit that replaces the standard torque arm that is regularly furnished with the Dodge Speed Reducer. (The two are interchangeable.)
- Pressure exerted by an excessive load causes a piston to move lengthwise through the unit, activating the mechanism instantly.
- This movement shortens the torque arm, loosens the belts and cuts off current simultaneously.
- A warning system can be hooked up to the micro switch of the Tri-Matic—to activate bell, siren or light.
- The Tri-Matic is calibrated for adjustment to the load conditions of any job. It can be set to act at any desired load up to the reducer's maximum capacity.
- It is easy to reset the Tri-Matic. Just pull the speed reducer back into position. This automatically cocks the release mechanism.
- The Dodge Tri-Matic Overload Release is available from distributors' stocks in sizes for all Dodge Torque-Arm Speed Reducers—in either single or double reduction series.

DODGE

A Division of the W. E. Dodge Corporation

BOWDIL FABRI-FORGED CUTTER CHAIN

The Fabri-Forged Cutter Chain is another development by Bowdil, brought to a high degree of perfection by modern production methods, metallurgical knowledge and heat-treating practice.

Designed for maximum, trouble-free service and constructed throughout of highest quality materials, carefully selected and processed, it will give long satisfaction on all types of

cutter heads and under all kinds of service conditions.

Despite its great strength and ruggedness and numerous advantageous design features, Fabri-Forged Cutter Chain is no heavier than other chains and is easy to maintain.

Used in hundreds of mines throughout the coal fields of the nation, it has set the standard for cutter chain performance and won the approval of operators everywhere.

WHY FABRI-FORGED CUTTER CHAIN saves time and reduces costs *6 WAYS*

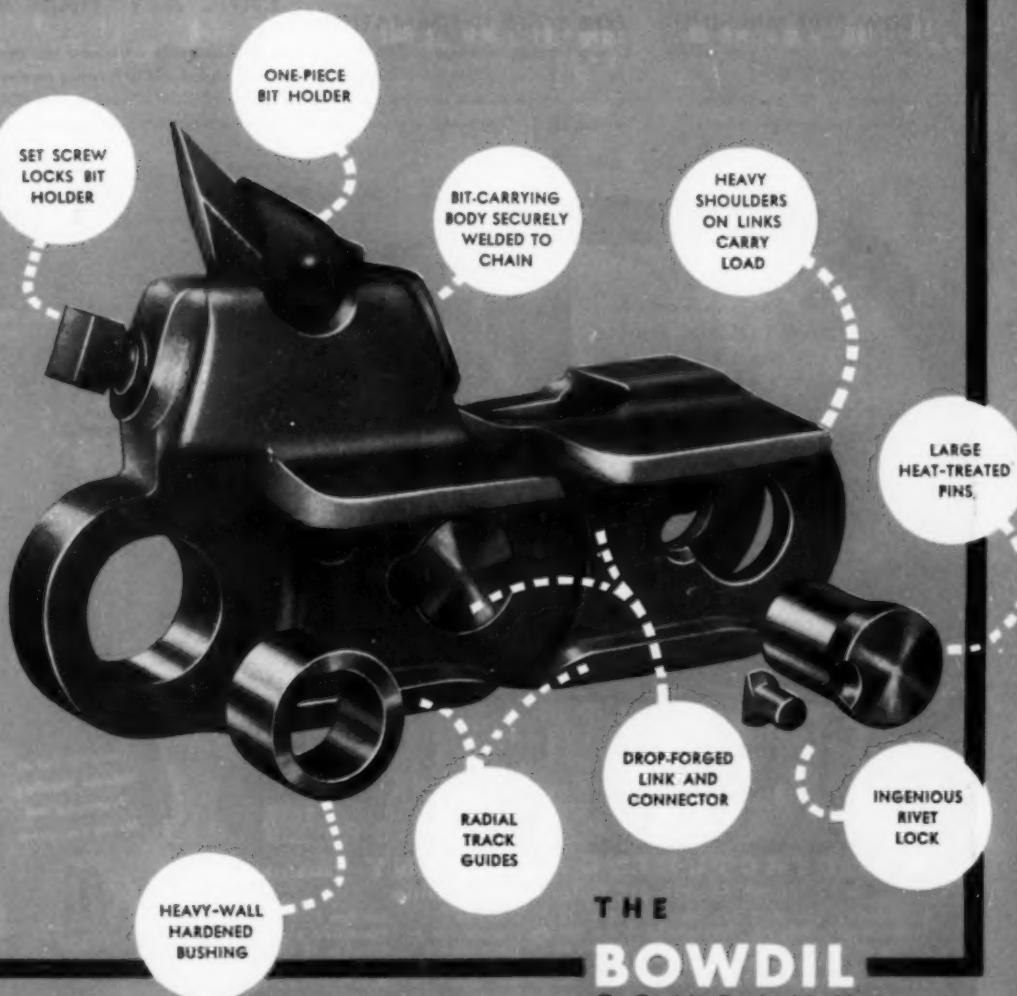
1. **Less Wear and Damage to Guides and Wearing Strips.** Bowdil's true-running radial track guide makes the chain circle the head at the correct angle, giving a smooth, wobble-free run that minimizes wear and prevents damage to guides and wearing strips.
2. **Extra Strength.** The drop-forged lug bodies and connectors are of equal strength . . . strong enough to withstand many times normal loads. There are no weak spots in Fabri-Forged Chain.
3. **Easy to Maintain.** Bowdil design makes removal, replacement and connection quick and easy. The simple, ingenious rivet lock principle makes it easy to remove the pin and bushing yet holds the assembly securely.
4. **Fast Bit Replacement.** Bowdil's one-piece holder wedges the bit securely in the lug projection. Individual replacement bits can be quickly and easily inserted and locked in position by means of a set screw with-

6 WAYS, CONTINUED

out removing the holder. No need to halt production for complete chain replacement when a few bits become badly worn or broken.

5. *Fits Any Job.* Bowdil's bit-carrying body is securely welded on the chain to meet any requirement for position, incising or kerf.

6. *Long Life.* Large alloy steel pins and bushings, heat treated for maximum resistance to wear, take the wearing action. Heavy shoulders on links and lugs carry the load and shock . . . distribute stress . . . lengthen the life and increase the efficiency of the entire cutting end of the machine.



THE
BOWDIL
COMPANY
CANTON, OHIO

Type 76-A

COLMOL

SAFE, FAST METHOD OF MINING LARGE QUANTITIES OF COAL

The COLMOL, one-process device, presents a new and important contribution to modern coal mining. With a single unit coal can be mined and loaded in one operation without the use of explosives. Need for separate drilling, cutting and loading is eliminated. Put the COLMOL to work . . . you can be sure that the emphasis will be on output, economy and safety.

LOW-TYPE MACHINE:

40 Tons per man (7-man crew)
Seam—38" to 45"
Advancing 18" per minute
Mining two tons per minute

FOR YOUR INFORMATION:

We are happy to announce that a complete and amicable settlement has been made in the recent litigation. The suit has been dismissed and Jeffrey has received an exclusive license to develop, manufacture and sell COLMOLS and MOLVEYORS in the U. S. Obviously, we will continue to take care of your requirements.

Photo shows the No. 76-A COLMOL mining by the popular "offset cut" method. An entry approximately 19 feet wide can be driven in two passes of the unit.

All operations are performed hydraulically. This low-type machine has a cutting range of 32" to 54" . . . weighs approximately 25 tons.



THE JEFFREY

MANUFACTURING COMPANY Established 1877

912 North Fourth St., Columbus 16, Ohio

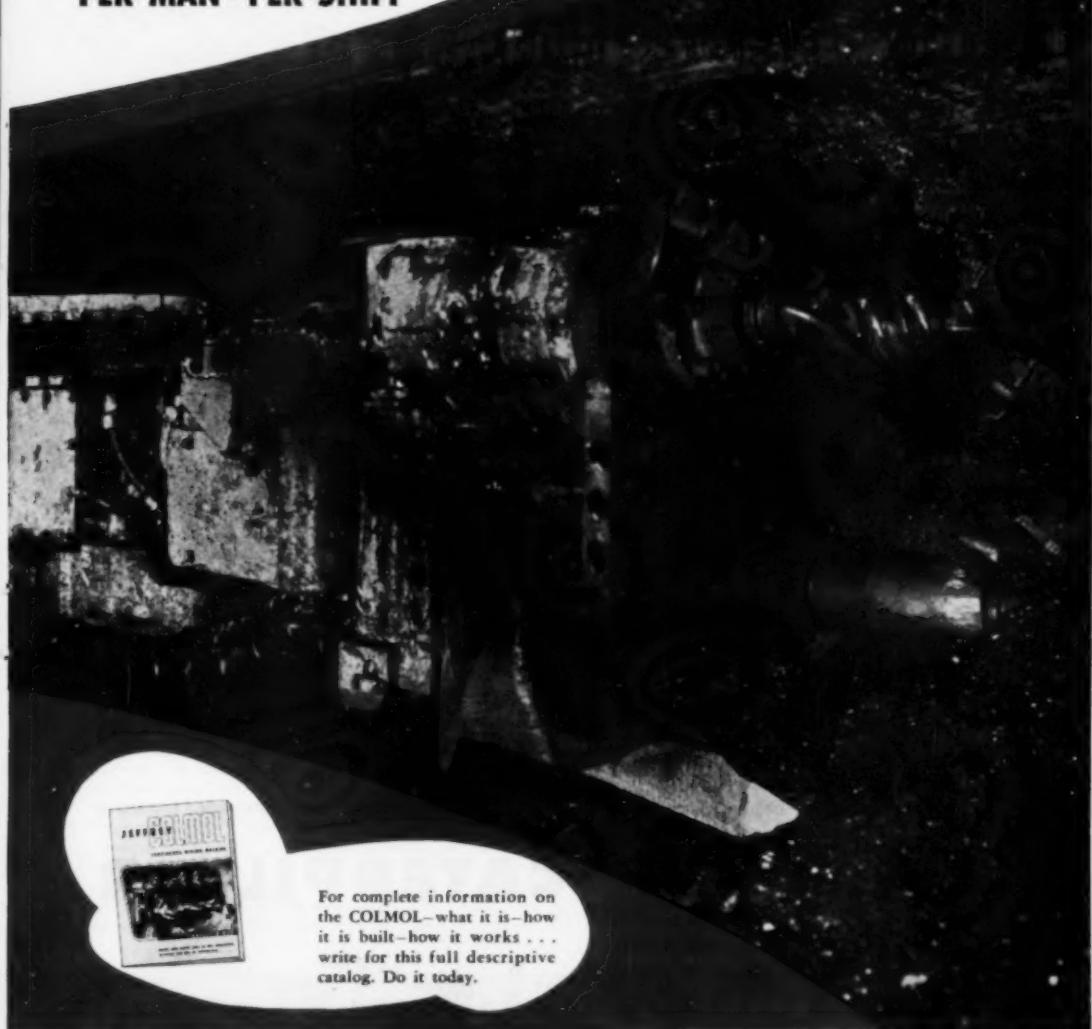
Complete line of
Material Handling,
Processing and
Mining Equipment

Baltimore 2 Boston 16 Cincinnati 2 Detroit 13 Houston 2 New York 7 St. Louis 1
Buckley, W. Va. Buffalo 2 Cleveland 13 Forty Fort, Pa. Jacksonville 2 Philadelphia 3 Salt Lake City 1
Birmingham 2 Chicago 1 Denver 2 Heron, Ky. Milwaukee 2 Pittsburgh 22
Jeffrey Mfg. Co. Ltd., Montreal, Canada The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
British Jeffrey-Diamond Ltd., Wakefield, England Galion (Great Britain Ltd.), Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A. The Ohio Malleable Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio



Champion Coal Producer

40 TONS
PER MAN - PER SHIFT



For complete information on
the COLMOL—what it is—how
it is built—how it works . . .
write for this full descriptive
catalog. Do it today.



"Cat" machines

handle the world's
toughest overburden

IN THE Edward James Coal Company's strip mine, north of Uniontown, Pa., 20 feet of the 60-foot cover is blue sandstone. Handling this rock is a job for rugged machines and smart operators.

It's being done by "Cat" D8 Tractors, equipped with No. 8S Bulldozers, and a Manitowoc shovel, powered by a "Caterpillar" D17000 Engine. Some of the 'dozer blade loads include slabs of stone two feet thick and seven feet across, weighing several tons. But they move just the same.

"Caterpillar" equipment is built to beat machine-killing jobs. Tough steels, specially hardened where the wear comes, sturdy construction and ample, dependable power are built in at the factory. Properly maintained and operated, your machines are ready to take on any job and stay in there slugging.

Right now it's more important than ever to keep your machines in good condition. Lubrication and mechanical attention take only a few minutes a day but they pay big profits in long, trouble-free work life. And you can count on your "Caterpillar" Dealer for top-quality service.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

The reliable machine
you see everywhere...
Work-horse of the
medium thin veins!

JOY 14-BU LOADER

In medium vein mining—36" to 60"—more coal is loaded by JOY 14-BU's than all other loaders combined. Unmatched durability, through advanced, simplified design, has made the 14-BU the world's most widely used loader. There are less than one-third as many wearing parts, and only half as many points of lubrication, as on comparable machines.

Breakage of the gathering mechanism, or any failure other than by normal wear, is virtually unknown on the 14-BU. The rigid design of the gathering head provides a compact and very strong construction. "Tight" shots and corners can be loaded out quickly and easily without fear of damaging the loader.

Because of the long tread-to-length ratio, which reduces pitching while trammimg, the 14-BU requires minimum roof clearance on rolling bottom.

Exclusive Magnetax control permits easy, positive, one-man operation. The rear roller-shaft is considerably oversize, to combat tail-conveyor damage. Like all assemblies of the 14-BU, it is readily accessible for easy maintenance.

The Joy 14-BU is produced in heights of 30½",

33", or 36", and will load up to 8 tons a minute.

Let us show you how JOY Loaders and other mining equipment can increase your production and profits—no matter what your conditions may be.

Consult a
Joy Engineer

WAD CL 3902

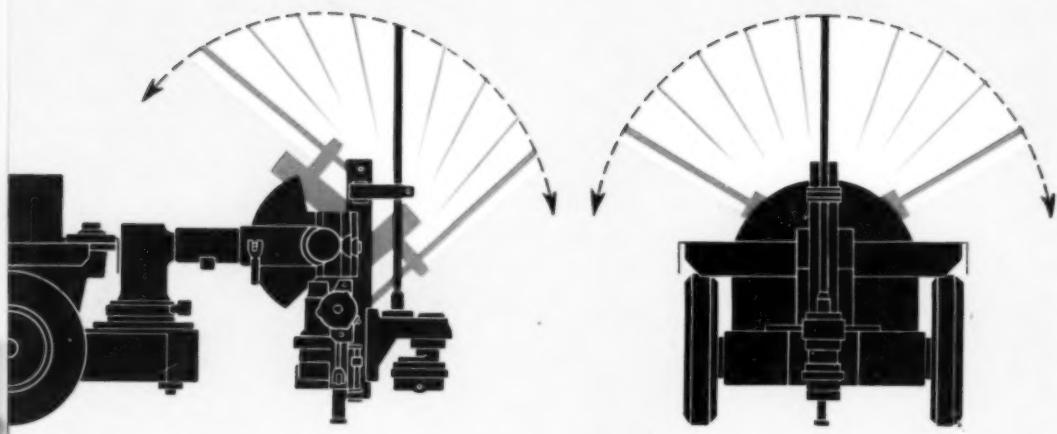


JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

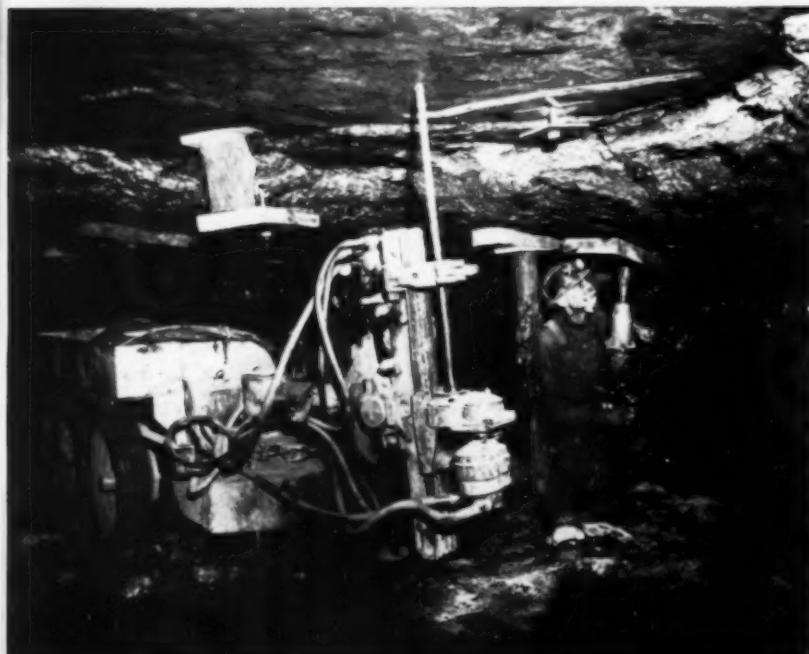
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

ROOF-BOLTING

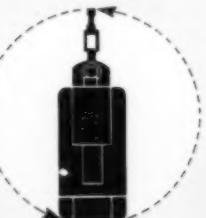


Side view of a Joy Hydraulic Roof Bolting Drill which illustrates the forward-backward tilting action possible with the unique Joy full-swiveling frame.

Front view of a Joy RBD, illustrating the full side movement possible. This and the forward-backward action, at left, permits drilling at any angle normally desired.



RBD-10—FOR TIGHT PLACES
A compact, self-propelled unit only 31" high, 36" wide and 8' 10" long. Unique tractor-type steering enables it to turn in its own length! The small size, easy maneuverability, and simple controls suit it for work in very restricted areas. Power is by a 10 or 15 H.P. hydraulic-pump motor.



TOP VIEW OF THE RBD-10 . . . IT CAN TURN IN ITS OWN LENGTH

AT ANY ANGLE with JOY HYDRAULIC ROOF BOLTING DRILLS

The drilling mechanism of JOY Hydraulic RBD Roof-Bolting Drills is mounted on a FULL-SWIVELING FRAME which permits operation at any angle necessary to compensate for pitching seam or rolling bottom. The angle of the roof-bolt is decided by the OPERATOR, *not by the slant of the floor*. As a result, only with JOY RBD Drills can roof-bolts be placed at exactly the proper angle for maximum support and safety.

Longer feeds necessitate fewer time-consuming steel changes. Variable feed speeds and rotation speeds provide instantaneous compensation for varying hardnesses in the roof strata.

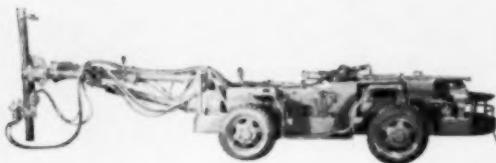
A central hydraulic system controls tramping,

steering, drill rotating, drill feeding, and boom swinging on most models. To facilitate manipulation while tramping, the operator can swing, raise and lower the boom from his platform.

Three models of hydraulic impact-wrench attachments are available to run the bolts onto the expansion shells or tighten the nuts on split-wedge bolts. No other bolting machine is necessary.

The high drilling speed of RBD Drills, their flexibility, and their easy handling permit high capacity trackless mining with a very small bolting crew. • Let us prove how JOY RBD Drills will step up your mining efficiency through faster, easier and safer roof-bolting.

RBD-8—STANDARD FOR MOST JOBS. The RBD-8 is powered by a 15 H.P. hydraulic-pump motor. Hydraulic controls simplify operation. The 9' 13 $\frac{1}{4}$ " boom may be swung 60° to either side, permitting a horizontal drilling width of 15' 4".



RBD-11 A twin-boom version of the RBD-8. Standard booms provide a drilling width of 23' 10"–29' is possible with extended booms. 26 H.P. hydraulic-pump motor.

RBD-7 Unmounted unit with same specifications as the RBD-8. Can be mounted on a mine car, shuttle car, or other machinery at hand.

RBD-12 Track-mounted unit similar to the RBD-8.

*Consult
a Joy Engineer*



JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

*Guardian
Genie of
MINING CABLE*



Illustrated above is a typical re jacketing job on a cable splice made with a JOY Vulcanizer and a type "B" Mold.

MOLDS AND SUPPLIES . . . JOY has them all. Each carefully designed or compounded to help you make professional *on-the-job* repairs of electrical cable jacketing. Bulletin RV106 (at right) describes this material and provides valuable operating recommendations.

Consult a Joy Engineer

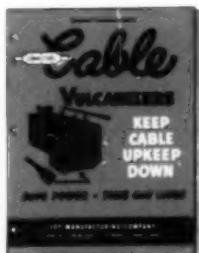


JOY STEAM HEATED VULCANIZERS

If there is a kindly spirit that looks out for mining equipment, JOY Cable Vulcanizers certainly rate among its best tools. Every year since their introduction in 1928, they've been more widely used for cable conservation. Today, with replacement cable often difficult to obtain—and with proper *on-the-job* repairs therefore multiplied in importance—JOY Vulcanizers really are the guardian of portable power lines.

Why take chances with cold-taped splices when permanent repairs can be made so easily and economically with JOY's proved method of cable maintenance? • You'll want to know how our 1952 units are being used to help maintain high mining production schedules in spite of cable shortages. Ask for a full description of the many advantages of hot vulcanization today!

YOURS FOR THE ASKING . . . A copy of this attractive 16-page bulletin covering JOY Steam and Direct Heat-type Vulcanizers, Molds and Supplies has been reserved for you. Write for it now.



W&O CL 4104

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.
IN CANADA JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

NEW!
THE TR 200
REAR DUMP
MOTOR WAGON



**TR 200 MOTOR WAGON
SPECIFICATIONS**

Here's your NEW LaPLANT-CHOATE ROCK WAGON

HERE'S a new addition to the well-known LaPlant-Choate line of Motor Wagons and Earthmovers. The 18-ton TR 200 is a hydraulically-controlled rear dump wagon flexibly joined to the same big rubber-tired tractor so successfully used on the LaPlant-Choate TS 200 Motor Scraper. It combines rugged power, big capacity and high speed with a host of other features to make this unit outstanding in its field.



FEATURES YOU'VE BEEN LOOKING FOR IN A REAR DUMP WAGON

Stable wheel base assures absolute safety when dumping over edge.

Rock Lug tires.

Protected cab.

Your choice of two diesel engines in the T 200 Tractor . . . a 176 HP Buda or a 165 HP Cummins.

No obstructions in the wagon body. Tilts to 70° from horizontal.

Full hydraulic control.

Rear dump advantages.

Available with heated body for use in cold climate to prevent freezing of material in load.

GENERAL

CAPACITY	
Struck, cu. yds.....	11
Heaped, cu. yds.....	15
Tons.....	18

OVERALL DIMENSIONS

Length.....	25'9"
Width.....	10'7"
Height.....	10'0"

WHEEL BASE

WHEEL TREAD	13'7"
-------------	-------

Tractor.....	6'8"
Wagon.....	8'8"

TIRES

4—21.00 x 25—24 ply rock lug	
------------------------------	--

BRAKES

4-wheel air Timken-Detroit.....	18" x 7"
---------------------------------	----------

TURNING

Width required 180° turn.....	31'3"
-------------------------------	-------

Degree of turn each way..... 60°

HYDRAULIC SYSTEM

IPC Fluid Power Unit	
----------------------	--

Steering—25 GPM Model HU25

Wagon operation—40 GPM. Model HU40

SHIPPING WEIGHT

(Approx. in lbs.) 40,000

T 200 TRACTOR

ENGINE

Buda Diesel Model 6-DA-779.....	176 HP
---------------------------------	--------

or

Cummins Diesel Model HRB-600.....	165 HP
-----------------------------------	--------

ENGINE CLUTCH 17" Lips Railway

TRANSMISSION Fuller 5A1120

SPEEDS

(at 1800 RPM—MPH) From 2.46 to 21.63

STARTING METHOD

Electric 24 V

AIR COMPRESSOR

Bendix-Westinghouse .7/4 cu. ft. capacity

ELECTRIC SYSTEM

12 V

FUEL TANK CAPACITY

—U. S. gallons

R 200 WAGON

MISCELLANEOUS DIMENSIONS

Loading height, rear..... 5'6"

Loading height, side..... 8'3"

Bowl width..... 8'0"

Bowl depth, maximum..... 4'8"

Bowl length..... 11'3"

OPERATING METHOD

Type of ejection..... Rear dump, hyd. lift

Number of jacks (double acting)..... 2

Size of jacks..... 6" x 31"

DUMPING ANGLE

..... 70°

LAPLANT CHOATE

MANUFACTURING CO., INC.

CEDAR RAPIDS, IOWA, U. S. A.



Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of truck-type tractors.



2- and 4-yd. Scrapers for truck-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.

William Heinlein, Superintendent
of Champion No. 1 Plant
and part of the 17 Denver
"Sub-A" Flotation Cells



17 YEARS OF COAL FLOTATION

at Pittsburgh Coal Co. Division of Pittsburgh Consolidation Coal Company

Denver "Sub-A" Coal Flotation Is Economic Advantage... Wearing Parts Last 10 Years

Mr. William Heinlein, Superintendent at Pittsburgh's Champion No. 1 plant reports:

"The flotation section of this plant was installed in 1935. It is, I believe the oldest coal flotation operation in the U.S. Our flotation plant has been practically trouble-free and in every way has been an economic advantage.

Plant Operation—"Our Champion plant treats 30-35 tons of coal fines (trace + 48 mesh) per hour in 17 No. 24 (43x43) Denver "Sub-A" Double Overflow Flotation Machines. These are arranged as 2 6-cell units and 1 5-cell unit in parallel. The froth is cleaned once and is filtered on 2 drum filters covered with cotton twill cloth. The filter cake contains 22% moisture.

"The products have the following ash content:

Feed	17-22% ash
Concentrate	9.5-10.5% ash
Refuse	60-73% ash

"At Champion No. 1 coal fines are conditioned with tar acid oil and coal spray oil, then distributed to the 3 parallel flotation circuits. Reagents are added to the 8'x 8' Denver (patented) Super Agitator and Conditioner. The coal flotation froth is filtered direct.

Wearing Parts Last 10 Years—"Flotation parts—the molded rubber impellers and hoods—were last replaced in 1941. This means they have seen 10 years of operation. New parts, however, are on order and will be installed when received. The direction of impeller rotation is periodically reversed.

"Experience has proved that our judgment was sound in pioneering coal flotation with Denver Equipment Company. Our relations have always been the best."

18 Installations of Denver "Sub-A" Coal Flotation in U.S.—In addition to Pittsburgh Consolidated Coal Company there are 17 other Denver "Sub-A" equipped coal flotation plants in the U.S. and more than 32 in Great Britain and other countries.

Coal Flotation Tests—One of the best

ways to determine whether or not you are disposing of marketable coal through washery waste and settling ponds is a laboratory coal flotation test. These tests are extremely low in cost and as in the case of Pittsburgh's Champion No. 1, may lead you to a definite economic advantage in plant operation. Denver Equipment Company, 1400 Seventeenth Street, Denver 17, Colorado, will be pleased to send you full details without obligation on all phases of laboratory tests and coal flotation.

DENVER EQUIPMENT for Coal Processing

Denver Mineral Jigs



Denver Super Agitator
and Conditioners



Denver Hydroclassifiers



Denver Thickeners



Denver Reagent Feeders



Denver SRL Pumps



Denver-Dillon Vibrating Screens



Denver Disc Filters

FLOTATION

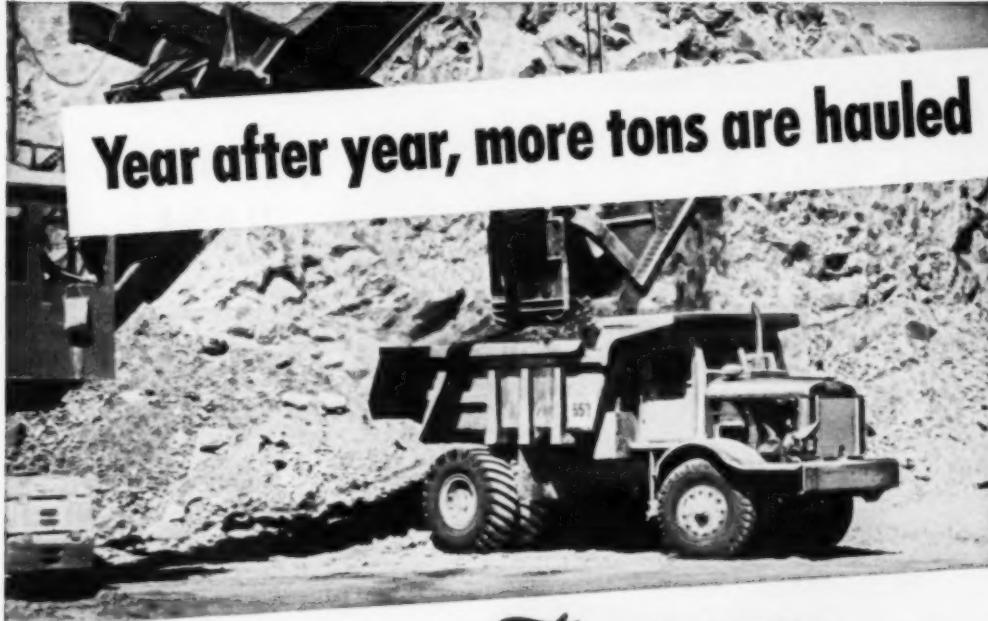
ENGINEERS

"The firm that makes its friends happier, healthier, and wealthier"

DENVER EQUIPMENT COMPANY
P.O. BOX 5268 • DENVER 17, COLORADO

DENVER • NEW YORK CITY • EL PASO • TORONTO • VANCOUVER • MEXICO D.F. • LONDON • JOHANNESBURG





Year after year, more tons are hauled

on **GOOD YEAR** tires
than on any other kind!



Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

NO-TURN SHUTTLE HAUL



In confined underground operation, fast-shuttling dumpers are ideal for no-turn hauling in tunnels and along narrow passageways. Also note how low rear entry to Dumper body permits easy loading under low ceilings. Compact body is 6' x 8' for loading over end or sides.



This mountain-side job shows typical no-turn shuttle advantages. Hauling along narrow ledge, Dumper spills close to Roaching 1½-yard 666 — gets its load, drives to fill, dumps, and returns to the shovel — without turning. Dumpers are operated with equal ease in both directions.



increases hourly output over 10%

With Koehring fast-shuttling Dumptors, there is no need to turn at the loading unit, along narrow haul roads, or at the dump. Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Every turn saved cuts 15 seconds off your cycle time, and adds up to a big increase in yards hauled per hour.

On a 1,000-foot haul, eliminating only 2 turns saves $\frac{1}{2}$ minute every round trip. Where you

would get an average of 13.6 trips per hour with 2-turn operation, Dumptor no-turn shuttle hauling gives you 15.4 trips. That's an increase of 1.8 trips an hour on the same, 1,000-foot haul.

Fast, easy spotting and 1-second gravity dump also help keep production high. Your Koehring distributor can show you many other cost-cutting advantages with heavy-duty, 6-yard Dumptors.

KOEHRING COMPANY, Milwaukee 16, Wis.

KOEHRING Subsidiary Company **DUMPTOR®**



Again Outstanding DESIGN for New Speed and Economy in Drilling

Parmanco

MODEL 51 • SELF-PROPELLED • HYDRAULIC
COAL AND CLAY DRILL

This Model 51, one-man operated drill, adds another unit to the top performing PARMANCO line of drilling machines.

An example of its great value is seen in its ability to drill 2½-inch holes at a speed up to 7 feet per minute in No. 5 coal. It will also handle 4¼ - inch augers up to 25 feet in depth.



• Hydraulic Feed • Finger-Tip Controlled • Fluid Motor for Auger Rotation



4 Jacks and Power Winch optional at extra cost.

Above
**New Automatic
CUTTINGS SHIELD
and
GUIDE**

Model 51 is equipped with the newly perfected Automatic Drill-Cuttings Shield and Guide. Now blast holes are kept absolutely clean from cuttings. Note in picture how a dam is formed about the blast hole, excluding casual surface water.



Looking down on New Automatic Drill-Cuttings Shield and Guide located at the right of driver's seat.

**Send for
Complete Details**

PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS

Cost-cutting, ton-increasing advantages

of **Goodman**
TRACTOR TREAD
LOADERS

PATENTED

Swinging loading head
Swinging discharge end
Continuous loading action
Powerful digging ability
Rugged construction
Easily accessible
Safety for the operator

Read about them in descriptive literature available upon request. Hear about them from a Goodman sales engineer who will be glad to give you complete details. See about them for yourself during a mine visit we will be happy to arrange for you.



19401

▲ 43" over-all height. Suited for discharge into large shuttle cars



19572

◀ 31½" over-all height; 22" coal line height



19561

26½" over-all height; 17" coal line height ▶

Goodman MANUFACTURING COMPANY
HALSTED STREET at 48th • CHICAGO 9, ILLINOIS

CUTTING MACHINES • CONVEYORS • LOADERS • SHUTTLE CARS • LOCOMOTIVES



A typical Bethlehem prefabricated track layout.

You Can't Afford to Waste Rail Today!

If your mine is one of those that still cut and curve their own rails, how much discard goes into your gob pile? 5 pct? 10 pct? The higher figure isn't at all unusual. A hundred feet of waste in every 1000 feet of delivered rail.

What's the answer? Is there an answer? Yes!

It's Bethlehem prefabricated mine track. This track comes to you *precut to proper lengths*, precurved to proper radii. There isn't a foot of wasted rail in a Bethlehem prefabricated layout. Even the turnouts are just exactly right when they reach the customer.

How is this possible? Well, as many operators now know, Bethlehem engineers the system, first devoting close study to the mine's transportation problems. As a result, the track layout is built to meet the exact requirements of the individual mine. All the owner has to do is install it—and that's a simple matter, even

with inexperienced crews and minimum supervision.

So, besides having no wasted rail, you save the cost of cutting and curving; you save on engineering and installation time. In these and other ways, Bethlehem prefabricated track is a practical solution to many haulage problems. Call us for details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



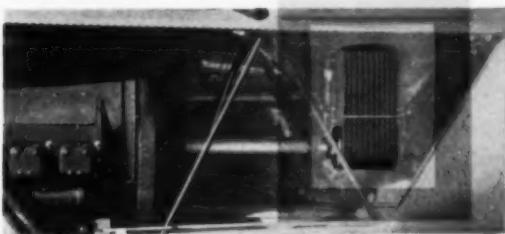
BETHLEHEM PREFABRICATED TRACK

Gates V-Belts are chosen to keep HELICOPTERS aloft!

Because a helicopter is air-borne entirely by the turning of its rotors, McCulloch Engineers who designed this helicopter and supply it to the Navy had to be sure that the drive to the rotors was, above all, safe and reliable—a drive that would not fail when the helicopter was in the air.

The special difficulty in designing this drive was the extreme compactness required.

On small diameter pulleys and short center distances, the drive must handle 200 horsepower for 1000 hours at cruising speed and 500 hours at high speed. Ordinarily, it would have been impossible to achieve these results.



A Notable Application of Gates SPECIALIZED Research

However, Gates had developed a V-Belt which in thousands of applications had proved to have the exact characteristics required for this helicopter drive—and Gates had also developed design data which showed at once the applicability of this belt.

It was not by accident, therefore, that Gates Engineers were at once prepared to supply a V-Belt capable of handling this most exacting assignment and



McCulloch Tandem-Rotor Helicopter

(Above) Two-place helicopter employs tandem-mounted, intermeshing rotors—a total of six rotor blades—powered by a 200-hp, six-cyl., aircooled horizontal engine installed at the rear. (Lower left) Gates-engineered V-BELTS, shown to rear of the engine, transmit power from the engine to the main drive shaft which in turn drives the reduction gearing for the rotors.

—in close co-operation with McCulloch Engineers—they developed the drive shown which has most successfully met all requirements.

Gates readiness to meet successfully *any* V-Belt Drive assignment is possible because Gates runs an average of 32,000 hours of testing *every week* on V-Belts alone! (32,000 hours is equivalent to *five years* of life for one belt.)

And the real value to you of such exhaustive testing is this: Laboratory findings are carefully checked by tests made under actual field conditions and the results are at once reduced to *usable data* for the design of V-Belt Drives to *perform whatever task may be required!*

Phone for a Gates Field Engineer

If you have a difficult drive to design, or if some drive in your plant is giving trouble, or if you only want to be sure what size and construction of V-Belts will give the most efficient and the lowest cost service on any particular drive—you have only to phone a Gates Field Engineer, *always near you* in all industrial centers.

Just look in your phone book under "Gates Rubber." A Gates Field Engineer will come right to your plant and put at your service the full benefits of Gates V-Belt knowledge and experience *without the slightest obligation!*

ENG-522

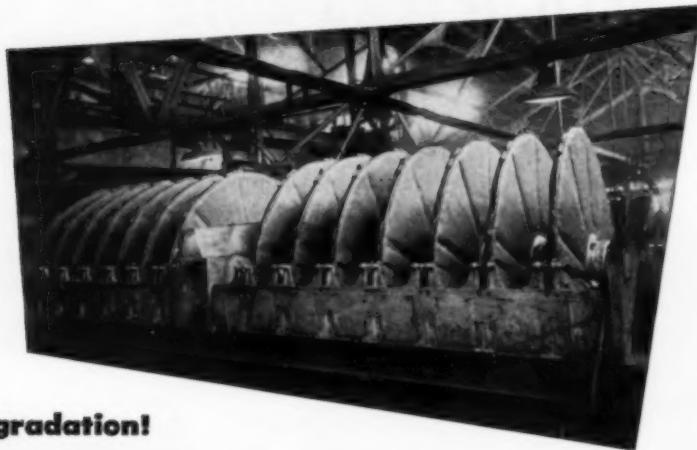
THE GATES RUBBER COMPANY

DENVER, U. S. A.

The World's Largest Makers of V-Belts

Gates VULCO ROPE **DRIVES**
Engineering Offices and Jobber Stocks
IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

DEWATERING FINE COAL



... without Degradation!

... with Clean Filtrate!

DO IT the American way. A play on words? Yes, but nowhere can you find a more effective, higher capacity unit for dewatering fine coal than the American Continuous Filter.

Better yet, nowhere can you find a unit which, considering the stream pollution problem confronting coal companies, will do what a real dewaterer is supposed to do: separate solids from liquids without letting the solids through in damaging percentages. Filtrate from the American Filter handling fine coal ($\frac{1}{8}$ " and under) carries on the average less than 1% solids.

And best of all — you will find that all this effective dewatering takes place *without any degradation of product*. The coal is handled gently.

Bring your fines dewatering problem to Oliver United. We have laboratory facilities and field test units for determining the best filter station. And we have several types of dewaterers to complement the American where sizes are such as to call for a different filter.

New York 18 — 33 W. 42nd St. Chicago 1 — 221 N. LaSalle St.
Oakland 1 — 2900 Glascott St. San Francisco 11 — 260 Calif. St.
Export Sales Office — New York • Cable — OLIUNIFILT

FACTORIES:
Hazleton, Pa.
Oakland, Calif.

OLIVER UNITED FILTERS

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

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Oliver United Filters Inc.
Oakland, Calif.

INDIA

Dorr-Oliver (India) Ltd., Bombay

EUROPE & NORTH AFRICA

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Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W. 1
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Melbourne
SOUTH AFRICA
E. L. Balem Pty., Ltd.
Johannesburg, Transvaal



Under water 9 months

-this belt is still in service!

The mine you see here was flooded to douse a below-ground fire — then pumped dry and reopened nine months later. And the G. T. M.— Goodyear Technical Man — found that the Coal-Flo main conveyor was as good as new and didn't need a thing done to it before going back in service!

Coal-Flo conveyor belts are serving under all sorts of below-ground conditions, handling r.o.m. coal longer, with minimum maintenance and maximum savings for mine operators. Ask the G.T.M. to discuss your coal-handling problems, or write Goodyear, Akron 16, Ohio.



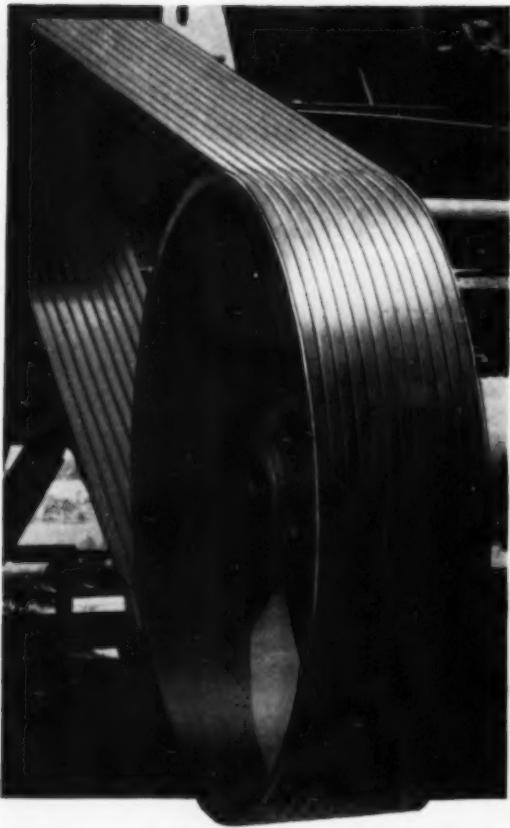
FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor. Look for him in the yellow pages of your Telephone Directory.

GOOD YEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD" — Every Sunday — ABC Network

Coal-Flo-T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



How to get Teamwork out of V-Belts

- ① Match them for length*
- ② Match them in make*
- ③ Check sheaves for alignment and groove wear

④ Install Sets of Bull Dog V-Belts for Uniformity of Quality...

replace it with a new belt. The new belt may be either shorter or longer than the remaining belts. If shorter, the excessive overload it must carry will cause early failure. If longer, it will not carry its share of the load, thus adding nothing to the life of the drive.

You can't be sure about length or compare hours worked unless you install new V-Belts by the set. You can't be sure of uniformity of quality unless you install Bull Dogs.

*Should an individual belt fail, it is neither practical nor economical to



Another Quality Product of
BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois Distributors in all Principal Cities
PLANT: CAMBRIDGE, MASS. P. O. BOX 1071, BOSTON 3, MASS., U.S.A.

Why use two or three lubricants when ~~one~~ does a better job?



GULF MINING MACHINE LUBRICANT

On most types of mining machines, Gulf Mining Machine Lubricant can do the entire lubricating job at the face. This enables you to simplify your lubricant storage and handling by eliminating two or three other lubricants. This also means a saving in application time and elimination of application errors.

And because Gulf Mining Machine Lubricant eliminates many of the lubrication troubles encountered with conventional lubricants in cutting and loading machines, repair and replacement costs are sharply reduced.

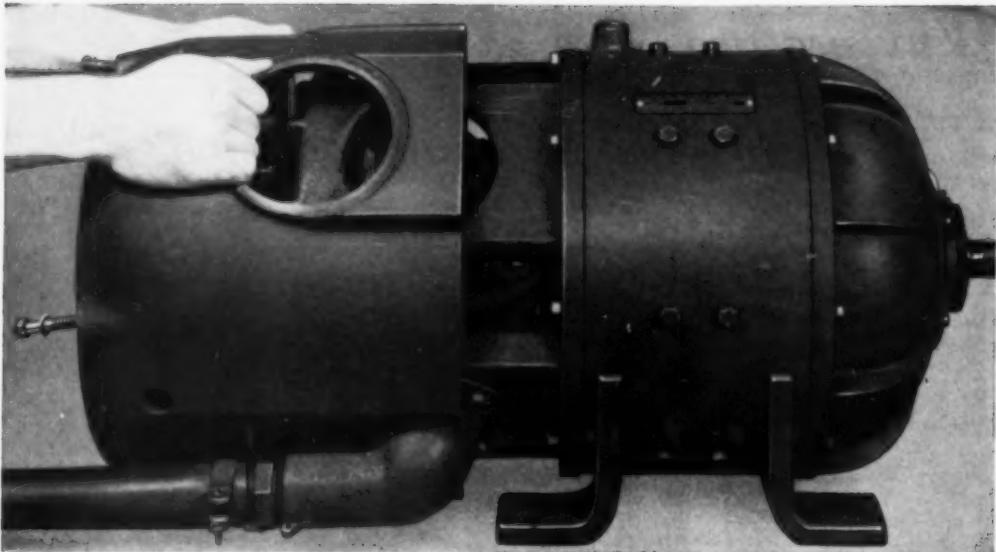
Improved lubrication with Gulf Mining Machine Lubricant also leads to fewer breakdowns,

less time in the shop—which add up to more productive time for equipment and greater tonnage.

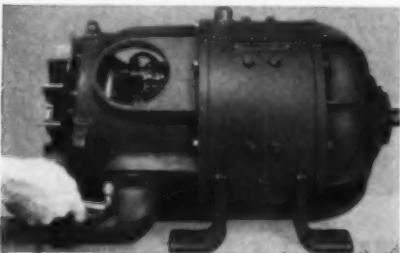
To get the many benefits possible with this quality lubricant, and for expert help on other phases of improved lubrication, call in a Gulf Lubrication Engineer today. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation • Gulf Refining Company
Gulf Building, Pittsburgh 30, Pennsylvania

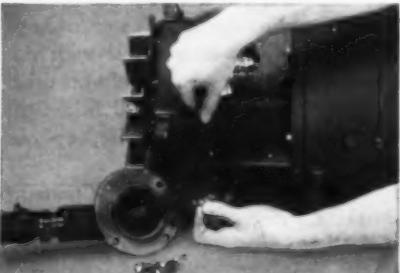




1 Remove fan housing and expose cable gland. Housing slides off easily after three bolts are loosened. Cable gland can also be supplied on opposite side of motor from that shown in the standard arrangement above. Gland does not extend beyond motor's normal width.



2 Remove cable gland and expose motor terminals. A few quick turns and the holding bolts are off. For greater ease in making connections, cable gland may be rotated 90 degrees in either direction from position shown, without removing motor from machine, or without making any internal changes.



3 Connect cable to motor terminals. Ample working room, plus generous-length internal leads and convenient terminals, makes this easy. Supplied with motor are 10 feet of multi-conductor neoprene-jacketed cable with ground wire for added safety, plus 10 ft. of 3-ply protective hose.

Easier cable connections—on the job!

New G-E mine motor—with removable cable gland—lets you install or replace cable without dismantling motor, simplifies maintenance!

Newly designed with installation and maintenance in mind, this General Electric d-c mine motor now makes it possible to make cable connections as often as necessary—right on the machine! It's the unusual lead-entry arrangement in the easily-removed cable gland that does the trick. No need to remove endshield, or work through commutator-access openings!

And that's not all! A host of other new features combine to make this mine motor, in ratings from $\frac{1}{2}$ to 50 hp, the way you want it—easier to inspect and maintain, longer-lasting, easier to install. Bulletin GEA-5553 tells the whole story. Ask your G-E representative for a copy, or write Sect. 663-17, General Electric Company, Schenectady 5, New York.

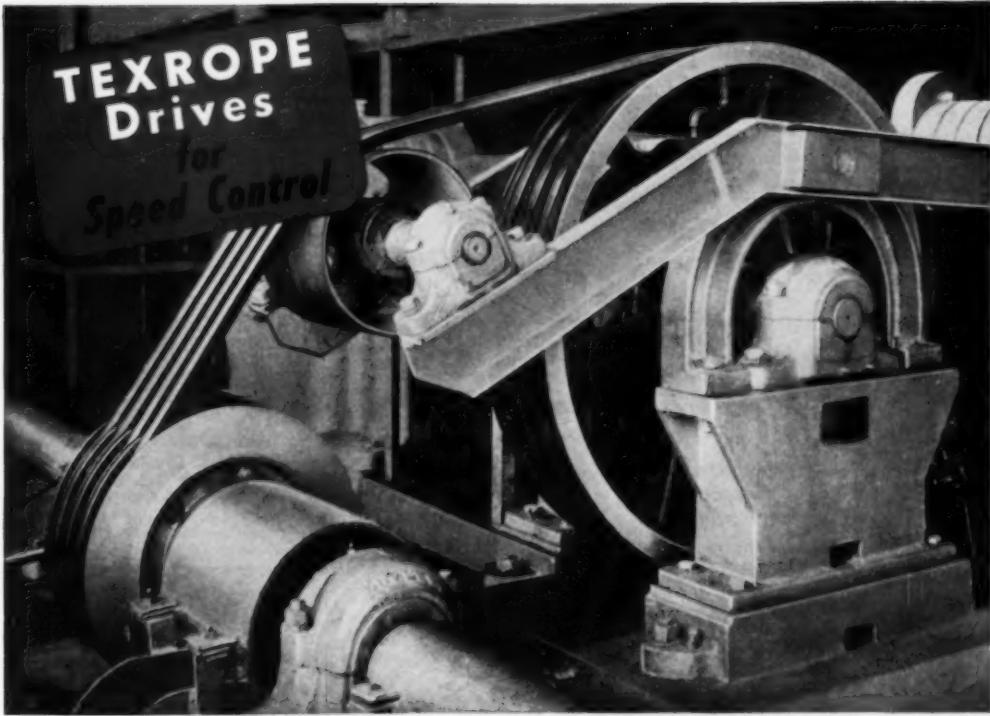
New

DC Mine Motors

Explosion-proof, listed by U.S. Bureau
of Mines, for any underground use

GENERAL  **ELECTRIC**

663-17



Get LOW COST Speed Control With TEXROPE Adjustable Speed Drives

MANY JOBS don't require expensive speed control arrangements. *Vari-Pitch* sheaves with standard motors can often do the job of multi-speed motors or expensive control devices costing far more.

Good example is in the Paper industry where *Vari-Pitch* drives handle the very critical job of maintaining synchronization between sections of huge paper-making machines. Similar problems are solved by *Vari-Pitch* drives in other industries.

Whether you want to change speeds

while your machine is in motion, or shut down, there's a *Vari-Pitch* drive in a type and size for the job.

GO TO V-BELT DRIVE HEADQUARTERS

Allis-Chalmers has the widest range of variable speed drives in the industry. In addition, more industrial V-belt drives have been engineered by A-C than any other company.

Call your nearby Allis-Chalmers distributor or district office, or write Allis-Chalmers, Milwaukee 1, Wis.

A-3580

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

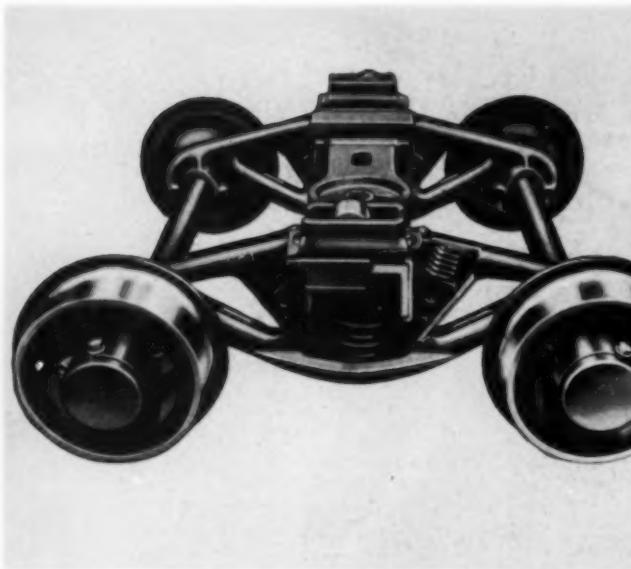


Choose from These Types of Variable Speed Drives

VARI-PITCH SHEAVES for A-B, B, C, D, and E belts — speed variation 15% to 25% per sheave. Capacities 1 to 125 hp. Stationary type — for changing speed when motor is stopped. Motion Control type — for changing speed when motor is running.

WIDE RANGE VARI-PITCH SHEAVES for Q or R wide belts provide up to 2 to 1 speed range . . . fractional to 40 hp. Available in Stationary Control and Automatic types.

VARI-PITCH SPEED CHANGER — enclosed unit for adjusting speed while machine is in motion. Provides up to 3.75 to 1 speed range. Capacities 1 to 75 hp.



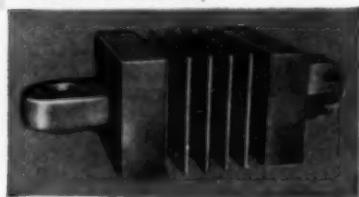
The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.



Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut* *per ton costs!*

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, always specify *National products*.



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-2002

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • NACO STEEL WHEELS



exclusive forced-flow lubrication keeps Eaton 2-speeds on the job, makes them last longer



PLenty of lubrication—always! That's one reason for the outstanding life and performance records being set by Eaton 2-Speed truck axles in every field of heavy-duty hauling! Eaton's exclusive forced-flow oiling system provides abundant lubrication even at lowest vehicle speeds. The instant gears turn over—even one revolution—oil is started on its way to all moving parts; the rate of flow is governed to meet the demands of various operating speeds. This unique lubricating system and Eaton's exclusive planetary construction are important factors in the ability of Eaton 2-Speeds to stay on the job, to deliver maximum performance with minimum upkeep. Ask your dealer to explain how Eaton 2-Speeds reduce stress and wear on engine and power-transmitting parts—how they will help your trucks haul more, faster, longer, at lower cost.

EATON *2-Speed Truck* AXLES

Axle Division

EATON MANUFACTURING COMPANY
CLEVELAND, OHIO



PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

A Statement by Anaconda on the Copper Situation

MANY users of copper have vital decisions to make . . . usually in connection with the present defense-induced shortages of copper and aluminum. This statement is an effort to remove the smoke screen surrounding the copper picture . . . to wipe away the confusion caused by too much talk supported by too few facts.

Substitution poses problems — Industry has been urged to substitute aluminum and other materials for copper. In some instances this may be logical and practicable. In many others it is difficult, if not impossible. But — before making *any* long-term decisions that may cost a great deal of money in engineering, new plant facilities or rescheduling of production operations — one should know the facts about the future of copper.

New Anaconda projects — The first major increase in copper production will come from Anaconda when the Greater Butte Project and the new Sulphide Plant at Chuquicamata, Chile, begin operations this spring. By 1953, these two projects should raise present levels of copper production by about 95,000 tons yearly.

Toward the close of 1953, Anaconda's new

Yerington project in Nevada is expected to start producing at an annual rate of 30,000 tons. By then, Anaconda will be adding to the present yearly copper supply at the rate of about 125,000 tons.

Other new projects — During 1954-55 still other new projects in the U. S. and friendly foreign countries will further augment the increasing copper supply. All told, it is estimated that by 1955, not less than 450,000 tons of copper could be produced annually — over and above present production levels.

Accordingly, in 1955-56, domestic production plus imports could bring the U. S. copper supply to 1,800,000 tons yearly. This would represent an increase of about 20% over present levels. Based on historical comparisons, and barring a large-scale shooting war, this amount of copper could support a Federal Reserve Board Index of Industrial Production of 270, an increase of 24% over the present, and 45% above the first half of 1950.

* * *

These are the 'things to come' in copper. On the basis of the facts there is no necessity for considering long-range substitution of other materials for the red metal.

SB320A

ANACONDA COPPER MINING COMPANY

The American Brass Company
Anaconda Wire & Cable Company
International Smelting and Refining Company

Andes Copper Mining Company
Chile Copper Company
Greene Cananea Copper Company

PRODUCERS OF: Copper, Zinc, Lead, Silver, Gold, Cadmium, Vanadium, Superphosphate, Manganese Ore, Ferromanganese.
MANUFACTURERS OF: Electrical Wires and Cables, Copper, Brass, Bronze and other Copper Alloys in such forms as Sheet, Plate, Tube, Pipe, Rod, Wire, Forgings, Stampings, Extrusions, Flexible Metal Hose and Tubing.

STYLE RDS

STYLE D

STYLE RD

CONTROLLED
FIRTHITE
QUALITY

FAMOUS BLUE BITS
KEEP ROOF DRILLING COSTS IN LINE!

UNIFORM
STRAIGHT
HOLES

FASTER
DRILLING
SPEED

LONGER LIFE,
MORE REGRINDS
PER BIT



**Engineering
Service**

Our Service Engineers are available to assist you with your roof drilling and auger problems. Write for catalog and address of Service Engineer nearest you.

A COMPLETE LINE OF ROOF DRILLING TOOLS

Whether you are drilling in a soft, medium, or hard roof . . . there's a FIRTHITE Mining Bit that will do the job better, faster, and cheaper. Famous Blue Bits operate efficiently in shale, slate, stratified sandstone, and limestone structures. They turn the really tough jobs into routine drilling operations. That's why, like many cost-conscious mining superintendents, you'll discover it's easy to straighten out roof drilling problems with these *straight-drilling*, ruggedly constructed FIRTHITE Famous Blue Bits.



R-255

Firth Sterling
STEEL AND CARBIDE CORPORATION
GENERAL OFFICES: 3113 FORBES STREET - PITTSBURGH, PA.

ORDER FROM STOCK
from one of these
Authorized Firth Sterling Distributors:

ATLAS SUPPLY & EQUIP. CO.
Clarksburg, W. Va.

AMOS A. CULP
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DIAMOND SUPPLY CO.
Evanston, Ind.

BUNLAF WELDING & SUPPLY CO.
Zanesville, Ohio

QUAKER SALES CORP.
Johnstown, Pa.

PERSINGER SUPPLY CO., INC.
Williamsport, W. Va.

PRENTISS INCORPORATED
Charleston 27, W. Va.

UNION SUPPLY CO.
Denver 2, Colo.

Announcement

Brad Foote Gear Works, Inc.,
1309 South Cicero Ave. Cicero 50, Illinois
has purchased and will operate
as its subsidiary the



**PITTSBURGH GEAR
COMPANY** | 27th & Smallman Streets
PITTSBURGH 22, PA.

- For more than thirty years, the **PITTSBURGH GEAR COMPANY** has designed and manufactured gears chiefly for the mining and steel industries. It has been relied upon for two well-known products: "Armored" Gears and Crane Track Wheels.
- The Pittsburgh Armoring Process is a unique development, guaranteed to give gears and wheels five times the life of untreated, and one-and-one-half times the life of oil-treated gears and wheels.
- As a wholly-owned subsidiary of **BRAD FOOTE GEAR WORKS, INC.**, **PITTSBURGH GEAR** will continue, and expand, its operations as a principal supplier of all types of gears and crane wheels for steel mills, mines, and industry in general. A stock of gears and parts for mine loaders, cutters, and locomotives will be maintained.
- The full research and development facilities of **BRAD FOOTE GEAR WORKS**, and its other subsidiary, **AMERICAN GEAR & MFG. CO.**, will become a part of the over-all service offered by **PITTSBURGH GEAR**. Thus a well-established gear manufacturer is strengthened by its affiliation with one of America's leaders in the gear engineering and manufacturing field.
- Your inquiries are invited.

Gunnar L. Anderson



BRAD FOOTE GEAR WORKS, INC.

Bishop 2-1070 • Olympic 2-7700

1309 South Cicero Avenue • Cicero 50, Illinois

subsidiaries

AMERICAN GEAR & MFG. CO. • PITTSBURGH GEAR COMPANY

Phone: Lemont 920
Lemont, Illinois

Phone: Atlantic 1-9950
Pittsburgh 22, Pennsylvania

REPEAT ORDERS CONFIRM POPULARITY OF **TIREX** **CAR CABLE**



Simplex-TIREX Shuttle Car Cable with the unusual "geared" design is barely more than two years old, yet it has already achieved widespread popularity.

The reason for this unusual popularity is not difficult to find. It is told in repeat orders and in letters from enthusiastic customers. Repeat orders, of themselves, are the finest testimonial any product can receive.

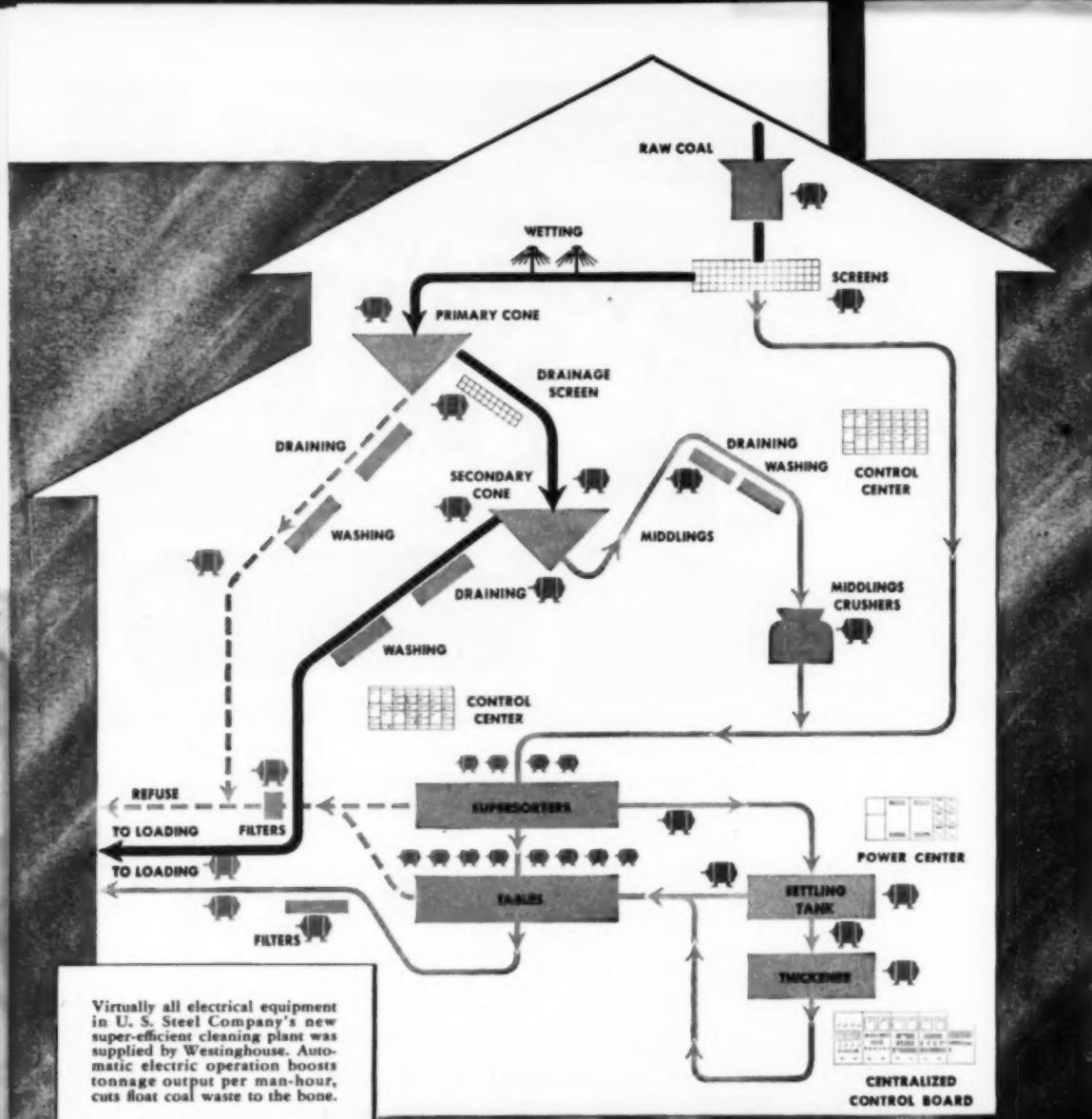
The letters explain why customers are buying Simplex-TIREX Shuttle Car Cable to the exclusion of all other types for shuttle car and mining machine service. The reasons given are many and varied but they all add up to the same conclusion. TIREX Shuttle Car Cable gives longer life under more rugged conditions and will haul more tons of coal per dollar of cable cost. That's a darn good reason for anybody to buy a product.

Have you tried Simplex-TIREX Shuttle Car and Mining Machine Cable yet for your "buggies"? If you haven't, you can get it from your mine supply house.

SIMPLEX-TIREX IS A PRODUCT OF SIMPLEX RESEARCH

SIMPLEX-TIREX

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.



Virtually all electrical equipment in U. S. Steel Company's new super-efficient cleaning plant was supplied by Westinghouse. Automatic electric operation boosts tonnage output per man-hour, cuts float coal waste to the bone.

3" to 1/4" COAL
 MIDDLELINGS
 REFUSE

you can be SURE... if it's
Westinghouse



EQUIPMENT FOR
 COAL MINING

How Automatic Operation Cleans 650 Tons of Raw Coal Per Hour

One of the world's largest, U. S. Steel Company's new cleaning plant at Robena, Pennsylvania turns out 650 tons of high-grade metallurgical coal per hour.

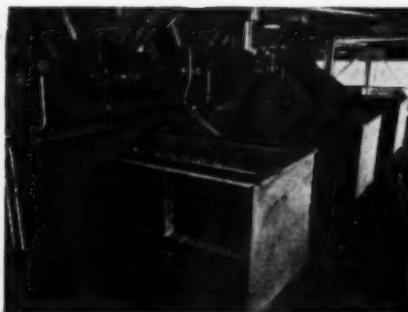
The last word in modern, efficient operation, the plant all but runs itself. The U. S. Steel Company and their cleaning plant designers, McNally Pittsburg Manufacturing Corporation, did a top-flight engineering job. And practically all the electrical equipment was supplied by Westinghouse, the electrical manufacturer with widest cleaning plant experience.

Plant Run by 18 Men. The basic secret of this outstanding operation is automatic, centralized control. A few buttons are pressed and the complex related equipment is started automatically, in just the right order. There's no time lost by men following check charts and running all over the plant. This reduces the chance of human error and, most important, it boosts output per man-hour. *Only 18 men on each shift run the entire operation.*

Smooth Operation, No Pile-ups. Once underway, plant operation is kept safe and smooth by additional electrical controls. If a piece of equipment becomes overloaded, a siren sounds to inform the operator. If the overload persists, coal feed to the unit is automatically stopped to prevent pile-ups. If the unit still remains overloaded it automatically shuts down to prevent damage.

Float Coal Losses Minimized. Another major advantage of automatic electrical control and first-rate equipment engineering is reducing the amount of coal sent to the refuse pile. It can't be eliminated entirely—but losses of float coal are kept to a minimum.

Call Your Westinghouse Office. When you're planning a new plant to turn out better coal and increase sales, make sure you get the best in electrical equipment. It makes a big difference. Call your Westinghouse office early in the planning stage. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-94848



Raw coal feeders are driven by Westinghouse motors and speed reducers. Motor speed is varied by remote control to adjust the rate of coal fed to the plant. All motors in the Robena cleaning plant are the totally-enclosed, fan-cooled type.



Incoming power enters these efficient, spacesaving Westinghouse power centers. Major elements are protective switchgear, ASL dry-type transformers (safest transformer ever built), feeder circuits to local control centers. (See next photo.)



How does he remember which motors to start first? He doesn't have to. Sequence-motor-starting automatically starts complex related equipment in the right order. Individual motor control is also provided for testing and special operations.



I'm the guy that convinced the Boss

"We ought to use more preformed rope," I told him. "In our type of work, it's a great help to have rope that behaves itself all the time."

"What are you getting at?" he wanted to know.

I pointed out that preformed rope is practically kink-free, handles like a kitten, spools easily, and actually stands up better on many kinds of jobs—including ours. Told him I figured Bethlehem Form-Set

would save us some money over a year's time. He asked about the first cost. I said it didn't run much higher than nonpreformed.

Couple of days later he was around again. He gave me the green light on Form-Set—but hinted it better be good.

That was last summer. Today we're still using Form-Set. And I've got orders in now for another year's supply—with the boss's okay!



Bethlehem Form-Set is preformed wire rope. Preforming greatly reduces internal tension so that the wires and strands lie calmly in place, even when cut. This absence of tension means greater resistance to bending fatigue; hence longer rope life on many applications.

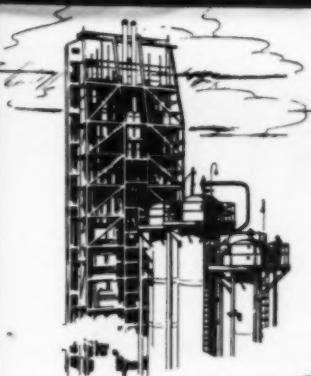
Shown here is a Form-Set rope with a strand and one of its wires lifted out of place. Note the complete absence of wildness. There are no inner forces to make the rope touchy or unlasy components.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE...think BETHLEHEM





Carefully Refined

to meet rigid specifications
of diesel engine manufacturers

Ashland

special
DIESEL
fuels and lubricants

Our modern refineries, including several catalytic plants, assure you the finest fuels and lubricants.

In every case where engine manufacturers have established specifications, we have equalled or bettered their requirements for that particular grade of fuel. Not only can we meet these requirements, but rigid controls over every refining operation assure that each shipment received adheres to these specifica-

tions. You can depend on Ashland diesel fuels for the same day-in, day-out operating efficiency.

Ashland also offers a complete line of tested lubricants. These include the well-known VALVOLINE and ENARCO brands which many operators of diesel equipment consider the finest in the field.



...complete line of lubricants for diesel equipment

ASHLAND OIL & REFINING COMPANY
ASHLAND, KENTUCKY

SUPPLY TERMINALS: Ashland, Ky. — Buffalo, N. Y. — Centon, O. — Cincinnati, O. — Cleveland, O. — Erie, Pa. — Evansville, Ind. Findlay, O. — Follansbee, W. Va. — Freedom, Pa. — Kenova, W. Va. — Kobuta, Pa. — Louisville, Ky. — Marietta, O. — Nashville, Tenn. — Niles, O. — Paducah, Ky. — Pittsburgh, Pa. — St. Elmo, Ill. — St. Louis, Mo. — Toledo, O.

On the **TOUGH** Jobs Operators know **JALLOY HEAT-TREATED PLATES**

... resist impact, abrasion and corrosion

... provide longer service life, lower maintenance costs

J&L STEEL



Cost-conscious mine operators throughout the industry are cutting maintenance and downtime costs by installing tough J&L Jalloy heat-treated steel plates on their equipment.

They've found that on the tough applications heat-treated Jalloy lasts 4 to 20 times longer than mild steel. The reason—Jalloy has the physical properties to resist the severe impact, abrasion and corrosion of mining operations. It is produced with a yield strength of 160,000 lbs. per sq. in. and a Brinell hardness of 341 to 388. The result—Jalloy saves money by cutting steel requirements, reducing downtime for repairs and replacement, and keeping labor costs for maintenance to a minimum.

Here are some of the applications where mine operators are using heat-treated Jalloy—Dump Truck Bottom Liners, Coal, Rock and Ore Chute Liners, Dipper Stick, Shovel and Drag Bucket Reinforcing. You can get Jalloy in bar form and in plates up to 72" wide and 20' long with thicknesses from $\frac{3}{16}$ " to $1\frac{1}{2}$ ".

Start finding out more about Jalloy today. Just write to Jones & Laughlin Steel Corporation, 412 Jones & Laughlin Building, Pittsburgh 30, Pa. We'll send you a free copy of our booklet, "For Longer Wear . . . Less Repair!" It will give you more complete information on the properties, heat treating and workability of heat-treated Jalloy, the modern mining and quarrying steel.



JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.



"You mean a

loose slot stick

stopped that

whole train?"

Certainly—but the report will say: "Motor failure was caused by a ground in the armature coil, 1 inch in from the end of the slot, pinion end." Overlooked in the report is the tiny slot stick, or wedge, which was made a couple of thousandths off size, or which was off a hair's breadth because of shrinkage. From it, coil vibration developed. Soon, a ground—motor failure—and the train couldn't make the grade. All over the world—in mines, in industry, in electric utilities—production trains can't make the grade because of "minor" failures deep in the bowels of motors and generators. National has demonstrated that the frequency of such "minor" failures can be drastically reduced. How? By insisting that every component which National supplies or installs must fit the particular job *that* motor or generator has to do—by refusing to be bound by standards set at some time in the obsolete past to fit general usage. We invite you to check the National record. We're proud of it.

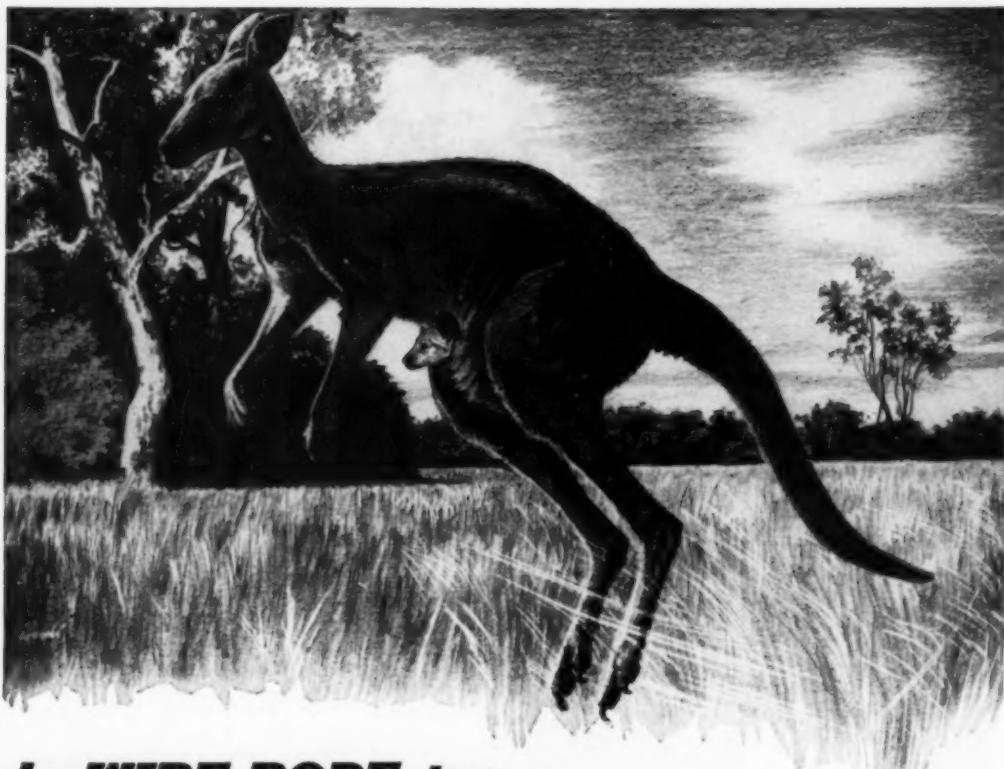
Wherever you are
on many fields
Progress is available



NATIONAL ELECTRIC COIL COMPANY



ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION—
REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES



***in WIRE ROPE, too
the RIGHT KIND of muscle
makes the difference***

Endowed with highly specialized leg muscles, the kangaroo is able to make tremendous flying leaps—even with Junior perched in the rumble seat.

In wire rope, too, specialized jobs call for specialized muscles. That's why in Wickwire Rope we make sure you always get the proper combination of physical properties to best resist the destructive forces found on your particular job—whether it be abrasion, load strain, shock stress or bending fatigue.

Wickwire Rope gives you the benefit of long experience and specialized know-how which assures you of exactly the right kind of rope your particular job demands. For additional information write or phone our nearest sales office.



LOOK FOR
THE YELLOW TRIANGLE
ON THE REEL

THE COLORADO FUEL & IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa

THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emeryville (Pa.) • New York • Philadelphia

WICKWIRE ROPE



PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

It's New!

Le Roi-CLEVELAND
S11ST Offset Telescopic Leg Stopper

It's Fast!

...and sized right

3 Sizes - 28" - 40" - 52" Feeds

It's Tough!

Built right by the leading
manufacturer of offset
and roof-bolting stoppers!



S11ST Stopper lengths
range from 29" closed
to 86½" open.

Only Le Roi-CLEVELAND S11ST gives you all these features for dependable, low-cost drilling

- ★ Convenient right-hand feed control provides the right feeding pressure for fast drilling in any rock.
- ★ Trip rotation release allows piston to strike straight, hammer-like blows.
- ★ Feed leg supported at backhead and chuck housing for extra strength.
- ★ Fewer packings to replace in air-feed leg means less trouble, easiest servicing.

★ Button in handle provides fast, positive feed release, for quicker, easier steel changing.

★ Constant blowing around front end prevents slush and cuttings from entering drill at front end and greatly reduces wear.

★ Water tube can be removed quickly —you don't have to dismantle the machine, just take off the backhead plug.

★ Shielded safety handle protects operator's hands.

★ Air consumption is low.

Standard Le Roi-CLEVELAND S11 Offset Stopers can be converted to this new telescopic type.

So get set for faster drilling and lower costs — standardize on these new stoppers. Write for complete details.



LE ROI COMPANY

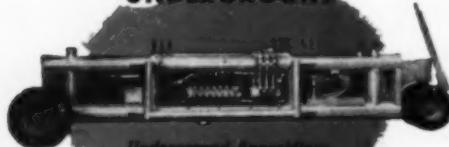
12500 Rockwood, Cleveland 11, Ohio

Choose from the **big 3**

Including the New
CARDOX-HARDSOCG

AUGERMINER

UNDERGROUND

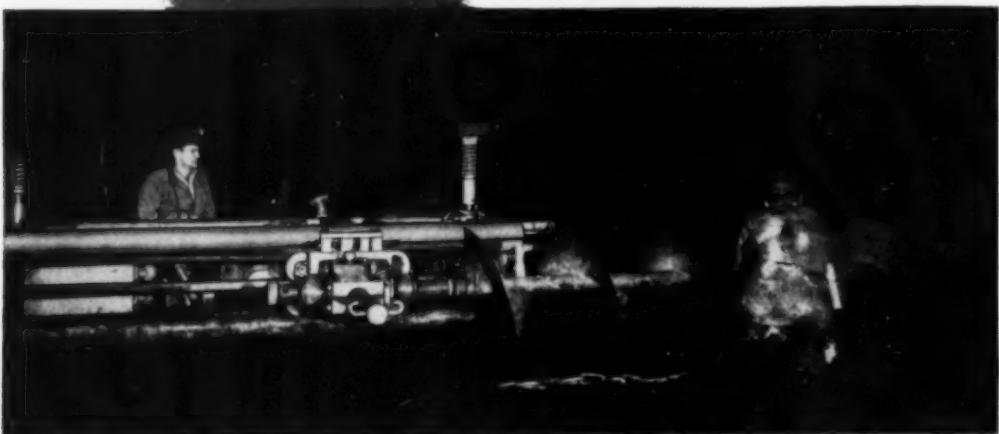


Underground Augerminer showing rubber-tired trammimg gear.

You can go back and get coal you had to give up not long ago! Every operator can remember numberless locations where the cost of timbering under poor roof conditions put early limits on operations. Now the Cardox-Hardsocg AUGERMINER is available to reach into thin seams and pull out coal that is hard to get by conventional methods. No need for excessive timbering.

This coal is highly profitable. Original development costs are already paid. It is cleaner because it can be obtained free of impurities from roofs and bottoms. An AUGERMINER and a portable conveyor will team up efficiently for continuous mining. Low and sturdy-constructed, this machine will handle augers up to 42" in diameter, in multiple sections 6' long. It is powered by a 25 HP, a 50 HP or a 75 HP electric motor—whichever is required to do the job.

Check into this practical method of gaining new profit from coal given up as hard-to-mine. Write for new bulletin on the Cardox-Hardsocg Underground AUGERMINER.



Mining Methods

AIRDOX

— the non-shattering force of compressed air

CARDOX

— the powerful expansion of released Carbon Dioxide

The
Powerful
Gentle
Giants

Non-explosive mining came into use with the introduction of Cardox and the subsequent addition of Airdox. Neither one has been approached since for power without shattering impact. As a result mines using either can achieve new low costs and new safety in working conditions even with on-shift shooting. Roof structure is preserved. The percentage of fines is kept low with a consequent cut in cleaning costs. Loading efficiency at the working face is improved for the same reason, and maintenance on loading equipment is kept low.

As an aid to your choice between Airdox and Cardox, our engineers will gladly confer with yours on the technical angles. Just write to say you would consider a recommendation.

Send for bulletin on any one of these:
Airdox, Cardox or AugerMiner



Typical fall of coal is broken with Airdox.

CHICAGO BRANCH OFFICES: CHICAGO, ILLINOIS • NEW YORK, NEW YORK • LOS ANGELES, CALIFORNIA • SEATTLE, WASHINGTON • TORONTO, ONTARIO, CANADA

Use ROOF BOLTING for Greater Economy

A modern roof-control system, using roof bolting, is economical because it provides greater safety, increased production, less material handling, faster transportation, and better coal preparation and mine ventilation.

To help you to obtain a sound, economical roof incorporating these advantages, Bethlehem is producing the two types of mine-roof bolts shown here. These bolts were developed by Bethlehem, and are made from new-billet steel in a variety of lengths. They can be used vertically or at angles, and are suitable for use with roof plates, roof ties, roof channels, plate washers, and angle washers. We'll be glad to discuss roof bolting with you at any time. Please send your request direct to us at Bethlehem, Pa.

BETHLEHEM SQUARE HEAD ROOF BOLT, with Expansion Shell. Assembly consists of special unchamfered square-head rolled-thread $\frac{3}{4}$ in. bolt, with expansion shell. Bolt has two pressed ears to support shell during anchoring. When bolt is tightened the plug, drawn down into expansion shell, expands the leaves of the shell to provide holding tension. Small, sharp projections on each leaf make contact with hole, and prevent shell from turning when bolt is rotated.



BETHLEHEM SLOTTED ROOF BOLT

End of bolt has forged slot to accommodate wedge. Slot is made by exclusive process which automatically centers the slot and forms the equivalent of two half-rounds. No steel is lost through burning. Other end of bolt has 5 in. of 1-in. rolled thread. When back of hole is reached, wedge is forced deep into slot, expanding end of bolt to provide tight grip. Truncated cone point prevents battering of threads. Bolt comes with regular square nut unless otherwise specified.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM MINE ROOF BOLTS

ROCK RATED!



P&H
MODEL
955-A

P&H MAGNETORQUE*

**is the electric swing
that never wears out**

Just what does Magnetorque mean to you in this great $2\frac{1}{2}$ yd. shovel? Simply this: It eliminates the old swing frictions with their constant headaches and replacement costs. It gives you the smoothest, slickest swing you ever saw—15% to 25% faster than any other machine of its size—and Magnetorque will last the life of your machine.

Add to this the rugged, rock-rated construction of welded high tensile steels—the

smooth hydraulic control—the greater stability and digging power—and you have the greater output which means greater profit. Better get all the facts about this outstanding machine—companion to the famous P&H 1055 ($3\frac{1}{2}$ yds.). Ask about the P&H 955-A today.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

HARNISCHFEGER
CORPORATION
4540 W. NATIONAL AVENUE • MILWAUKEE 14, WISCONSIN

An Important Announcement about Lubricating Costs



The Pure Oil Company's great new lubricants' plant near Beaumont, Texas, is now in full production.

This makes Pure Oil's complete line of top-quality lubricants available to a far greater number of industrial users than it has been up to now.

Many of these lubricants—contrary to usual practice—are designed to do several *different* jobs instead of one specific job, and to do each job *equally well*.

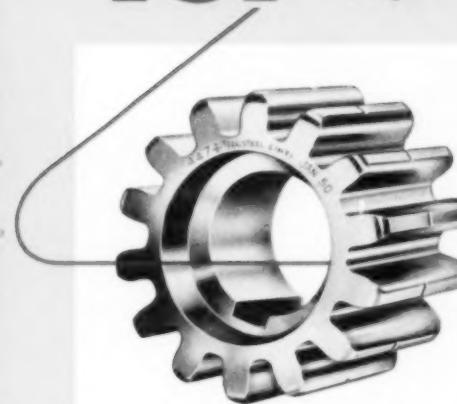
This enables you to do *all* your lubricating with *fewer* lubricants. In other words, you can

SIMPLIFY AND SAVE... WITH PURE OIL INDUSTRIAL LUBRICANTS

If this sounds worth looking into (and we assure you that it is) write:
The Pure Oil Company, Industrial Sales, 35 E. Wacker Dr., Chicago 1, Ill.

TSP

super resistance to wear and fatigue



guaranteed longer gear life



You get tremendous savings in operating and maintenance costs with "Tool Steel" gears and pinions! Each "Tool Steel" gear and pinion carries a written guarantee to provide greater service life than any other gear and pinion used in the same service. Your own records are used for comparisons.

"TSP" hardened gears and pinions contain all the qualities of any other hardening plus the super resistance to wear and fatigue that only "Tool Steel" can give you.

"Tool Steel" gears and pinions are made in all sizes to 80" pitch diameter and in pitches from the heaviest to 10 D.P. Special designs, applications, and quantities can be engineered to your requirements.

If you're planning a gear or pinion replacement, get the best . . . get "Tool Steel" and be protected.

TOOL STEEL PROCESS

"TSP" means "Tool Steel" Process . . . the name that carries an absolutely positive guarantee for longer, more economical and satisfactory service on gears, pinions and other hardened products.

THE **Tool Steel**
GEAR AND PINION COMPANY
CINCINNATI 18, OHIO • U.S.A.

We've Made Nothing But Coal Mining Equipment For The Past 80 Years

Use this specialized experience to obtain the most advanced design, the best of materials and the latest methods of manufacture. Take advantage of this background of creative engineering and long-standing reputation for sturdy construction that assured efficient, dependable performance at lower over-all costs. Call a Holmes Mine Equipment engineer for consultation in the planning and development of your requirements. There is no obligation.

HOLMES

MINING EQUIPMENT

SINCE 1872

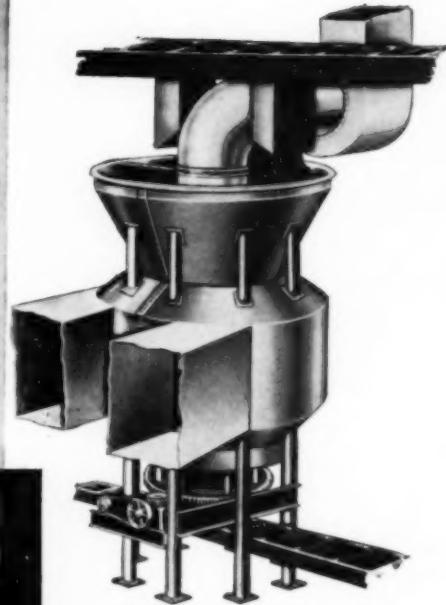


ROBERT HOLMES & BROS., INC.
DANVILLE, ILLINOIS

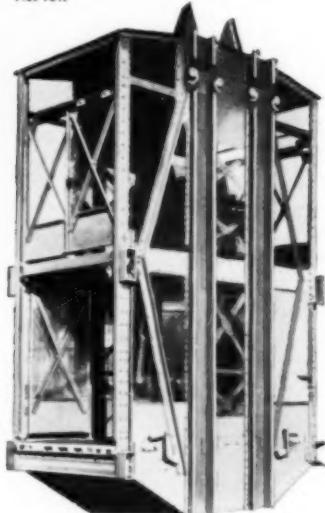


ADVANCE DESIGN HOISTS
feature the latest and most complete control equipment.
Ask for complete information.

HOLMES HEAVY-DUTY
CAGES in all sizes and types
for rapid hoisting and low
maintenance. Ask for complete
information.



BAUGHMAN "VERTI-VANE" THERMAL
COAL DRYER for economical, uniform large-scale
drying of all sizes, from $1\frac{1}{4}$ " down.
Reduces surface moisture to approx. 2%.
Unit handles 15 to 75 tph. Ask for Catalog
No. 101.



SHEAVES



TIPPLE
EQUIPMENT



CAGES



SKIPS



LOWERING SPIRALS



CAR PULLERS
AND RETARDERS



LABORATORY
CRUSHERS



HOISTS



VIBRATING
SCREENS



DUSTOLATORS



Wins every time

You can't deal yourself a better hand than U.S. Security. It's the completely dependable tape for electrical or general-purpose jobs. Security has no pinholes to cause leaks, will not dry out. It has high-dielectric strength, is straight-tearing, non-ravelling, will never let you down. ALWAYS Specify U.S. Security.

U.S. Security Rubber Tape
is unbeatable for perfect
splicing when used with
U.S. Security Friction Tape.

QUALITY PRODUCTS OF



UNITED STATES RUBBER COMPANY
TAPE DEPARTMENT • ROCKEFELLER CENTER, NEW YORK 20, N. Y.



Look at the difference

Stainless

These screens saw service at Sunnyhill Coal Company's New Lexington, Ohio, preparation plant. Both were installed on the bottom deck of a three-deck shaker for dewatering and sizing wet coal to $\frac{1}{4}$ " x 0.

The carbon steel screen—14-gage with $\frac{3}{8}$ " holes—was in service for one year, handling approximately 150,000 tons. Mud and elongated slivers of coal caused severe blinding. Rusting and abrasion shortened screen life, and the rough, blinded surface caused coal to move slowly

and build up on the deck of the carbon steel screen.

The U.S.S. Stainless Steel screen—12-gage with $\frac{1}{4}$ " x $\frac{3}{16}$ " x $\frac{3}{8}$ " shortalots (equivalent to $\frac{3}{4}$ " round hole)—was in service for two years and four months, handling approximately 265,650 tons of $\frac{1}{4}$ " x 0 coal and 539,350 tons of $1'' \times \frac{3}{4}''$ or $1\frac{1}{4}'' \times \frac{3}{8}''$ stoker coal. This Stainless screen was free from corrosion and blinding . . . had great resistance to abrasion . . . allowed coal to move freely.

In addition to handling more than five times the ton-

Sunnyhill Coal Company's preparation plant,
New Lexington, Ohio.





Steel

makes in coal screen life-

plus a saving of \$1,000 in labor charges alone for Sunnyhill!

nage, Sunnyhill officials report that this Stainless screen, because of its longer service life, not only saved the replacement cost of one set of carbon steel screens, but also saved approximately \$1000 in labor charges for screen changes. What's more, the reduced down time, both for cleaning and changing screens, meant worthwhile additional tonnage.

Take advantage of this increased tonnage and savings in labor in your preparation plant. When changing screens, check with your supplier on Stainless Steel. And for finest performance, specify U-S-S Stainless Steel for your screens.

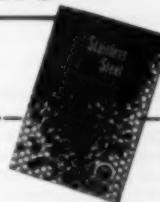
United States Steel Company,
Room 2801-P, 525 William Penn Place,
Pittsburgh 30, Pa.

Please send me your booklet, "Stainless Steel at Sunnyhill."

Name Title

Address

City State



AMERICAN STEEL & WIRE . . . COLUMBIA-GENEVA STEEL . . . NATIONAL TUBE . . . TENNESSEE COAL & IRON
UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS . . . Division of UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



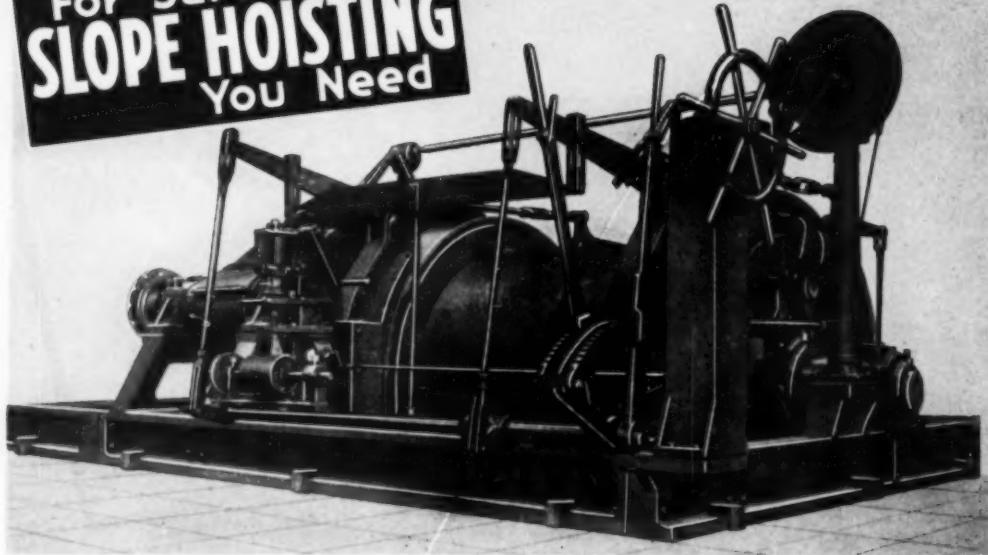
U-S-S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

2-847

For Safe
SLOPE HOISTING
You Need

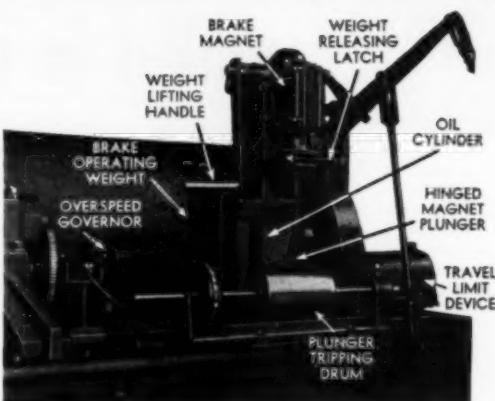


.. the Vulcan Delayed-Action Safety Device

Experienced mining men know how desirable it is that automatic application of the brakes on a slope-hoist drum should be delayed until the upward momentum of the trip has stopped and it begins to move back. Accumulation of slack is thereby prevented—eliminating danger of over-running the rope, or of breaking it if the trip falls back rapidly enough to take up the slack with a sudden jerk.

The Vulcan Delayed-Action Safety Device supplements the well-known Vulcan Dead-Weight Safety Device so that—when the electric power fails, or is cut off by action of either the overspeed governor or the travel-limit control—the magnet plunger falls only a fraction of an inch before coming to rest in a small revolving drum. This drum is chain-gearred so that its rotation is synchronised with that of the hoist drum, and the magnet plunger is hinged so it cannot complete its fall while the small drum is revolving toward it. When the drum has turned back a quarter of a revolution, however, the magnet plunger does complete its fall; thereby loosening the latch which supports the heavy "dead weight" and automatically applying the brakes.

Most new Vulcan slope hoists are now equipped with this device but our engineers also welcome opportunities to submit plans and specifications for its application to slope hoists already in service.



Illustrations above show the Delayed-Action Safety Device applied to a Vulcan Slope Hoist with hand-operated brakes. It is equally applicable, however, to our larger hoists having brake engines operated by either air or oil-hydraulic pressure systems. Write for Bulletin A-407.

VULCAN IRON WORKS

Main Office and Works WILKES-BARRE, PA., New York Office 50 Church

Heavy-Duty Electric Hoists

Belt-Contaminated Hoists

Scraper Hoists

Car-Spotting Hoists

Room Hoists

Shaking-Chute Conveyors

Chain Conveyors

Cast-Steel Sheaves and Gears

Cages, Skips and Gumboots

Electric Mine Locomotives

Steam Locomotives

Diesel Locomotives

geared and electric drive

Gasoline Locomotives

geared and electric drive

Load-Carrying Laries

Rotary Kilns, Coolers and Dryers

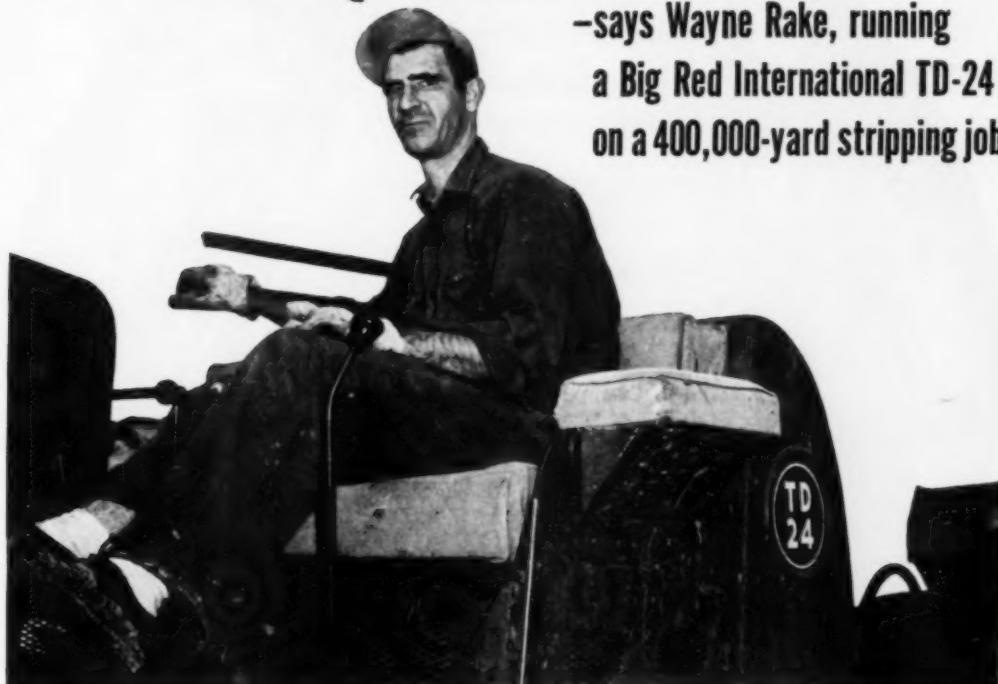
Briquetting Machines

Steel Castings

Heavy Special Machinery

"It's the Operator's Crawler"

-says Wayne Rake, running
a Big Red International TD-24
on a 400,000-yard stripping job



Contractor Hilding Ekdahl of Fort Dodge, Iowa, is working three International TD-24s top speed at a U. S. Gypsum quarry. One hundred feet of waste and overburden covering a 20-foot vein of pure gypsum is being removed.

On substantial earthmoving jobs like this, operators who like their crawlers can make a big difference in the final net profit figure.

Just listen to what one of Ekdahl's operators, Wayne Rake, has to say about his TD-24:

"This TD-24 with its turns with power on both tracks, is the easiest-operating crawler for any skinner. I can load more dirt faster

and make the delivery haul quicker than with any other crawler I ever operated. It's definitely an operator's crawler."

For more facts and figures on remarkable TD-24 performance that makes it the operator's pet, see your International Industrial Distributor. You'll be a TD-24 man from then on in!

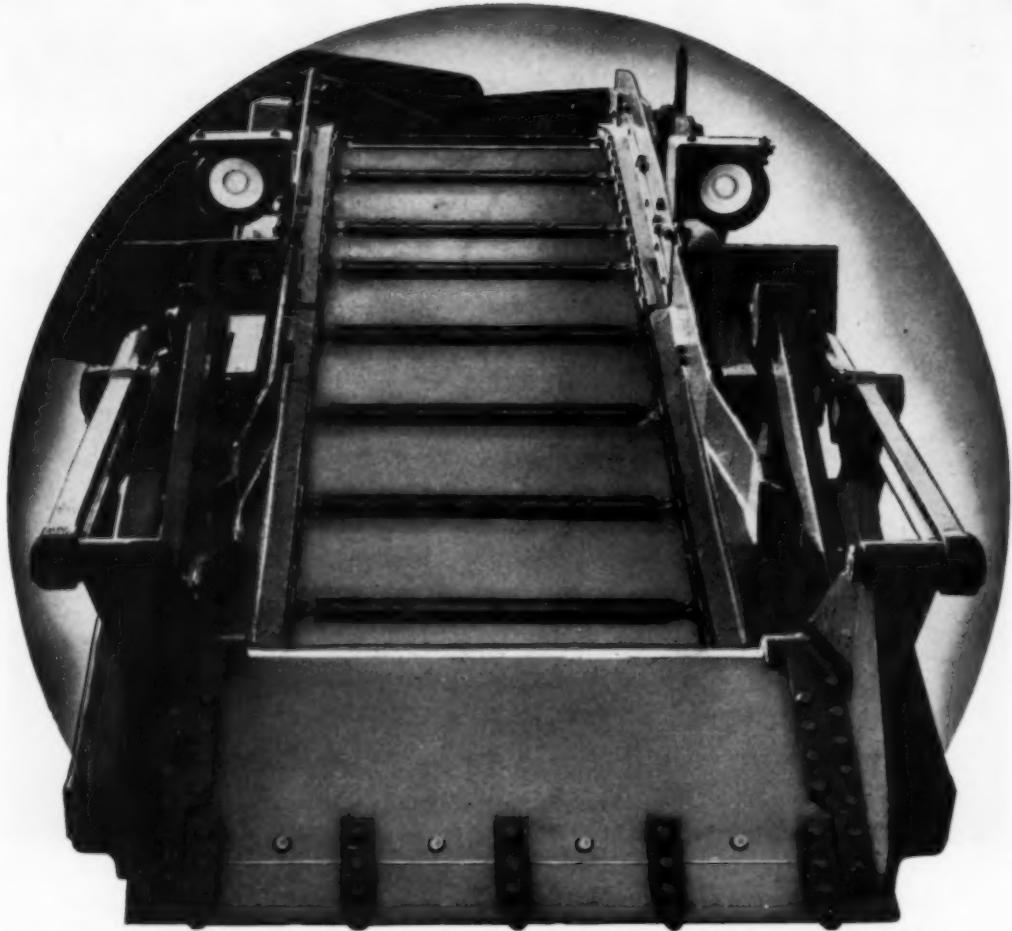
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



BIGGER PAYLOADS PAY OFF. International TD-24 and scraper strip heaping loads fast to get at pure gypsum underneath.



INTERNATIONAL
POWER THAT PAYS



No Other Loader Can Match Its Efficiency in All Classes of Material!

Today, more than ever, no coal mine trying to reduce costs by mechanization can afford to overlook the versatile loading of the powerful Whaley "Automat".

You can save on equipment investment, maintenance and man-hours when your loader is equally effective in loading coal, rock, slate or ore. The un-

matched flexibility of the Whaley "Automat" is due, for the most part, to its exclusive automatic shovel action loading head. The simplest and most effective gathering mechanism is the shovel.

But, back of the shovel is a first class machine, well known by reputation, for staying on the job day-in and day-out, loading consistently in all classes of material at the lowest possible cost!

For track or off track loading, investigate the versatile Whaley "Automat" now! Write to us today. Myers-Whaley Co., Knoxville, Tenn.

Note: The Whaley "Automat" is Now Available Either Track Mounted or Crawler Mounted.



MYERS-WHALEY COMPANY

MECHANICAL LOADERS EXCLUSIVELY SINCE 1908

**Totally-Enclosed
Fan-Cooled
MOTOR**

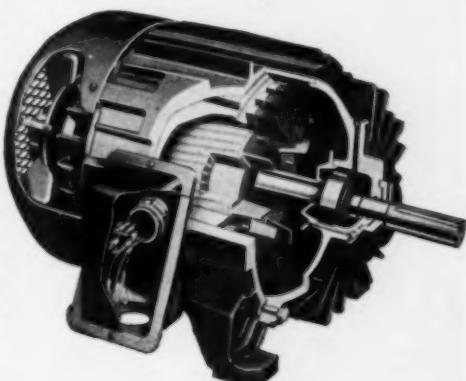
Look Outside

Greatly increased radiating area means greater cooling efficiency. More important, cooling efficiency stays high, regardless of operating conditions. There are no enclosed external air passages to clog and cause overheating. If oily dirt sticks, just wipe or blow it off. No matter how bad operating conditions are, this motor can be easily kept clean and cool running. Electrical parts are protected against corrosive atmospheres by cast iron yokes and end housings.



Look Inside

Double-shielded, heavy-duty ball bearings require no maintenance in ordinary service under most conditions. However, they can be lubricated without disassembly if required. Double shielding prevents over-lubrication, leading cause of bearing trouble. Rotating seals, where shaft extends through housings, keep dirt and moisture out of bearing chambers. Die cast rotor and interphase insulation are further assurance of long life and low maintenance.



See WHY THIS IS YOUR BEST MOTOR BUY

HERE IS A MOTOR that is different from conventional TEFC motors; built with an entirely different cooling system that gives you big savings in lower maintenance, more continuous service and less trouble in the toughest locations. Clogging can easily be prevented in the Allis-Chalmers Type APZ TEFC motor since areas that might collect dirt are exposed and easy to clean.

GET DETAILS NOW — Ask your nearby Allis-Chalmers Authorized Distributor or District Office for more complete information on this high performance TEFC motor. Or write direct to Allis-Chalmers, Milwaukee 2, Wisconsin. Ask for Bulletin 51B7225. A-3578

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

**Sold . . .
Applied . . .
Serviced . . .**

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.



TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



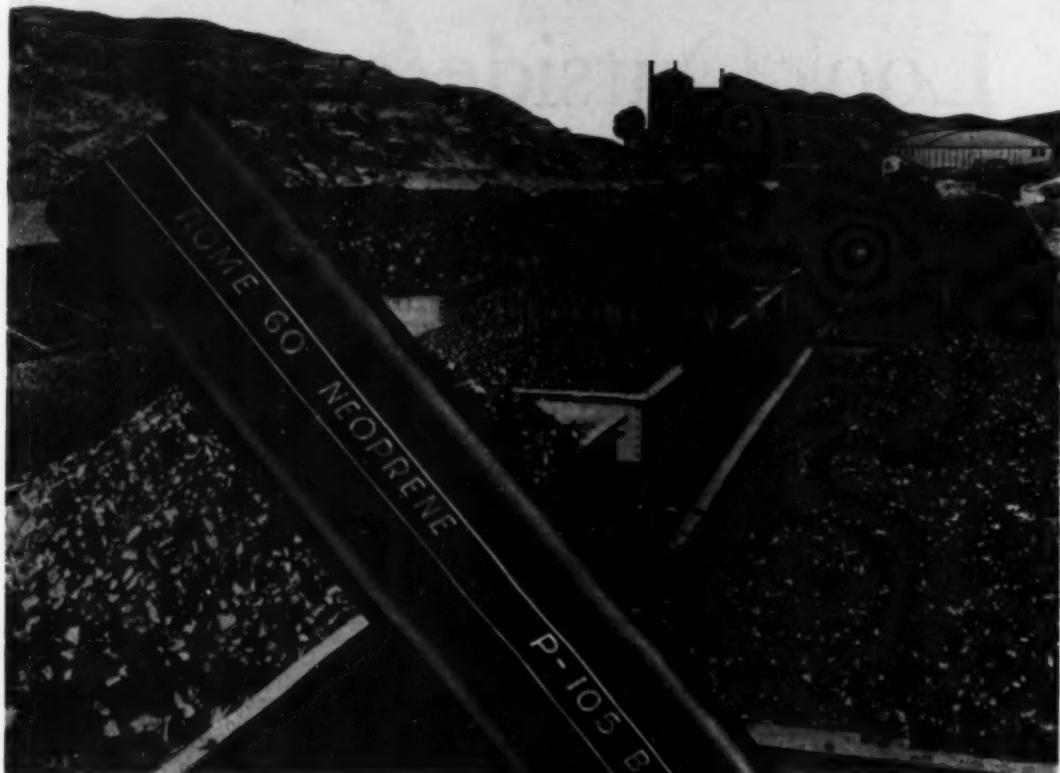
PUMPS — Integral motor and coupled types from $\frac{1}{2}$ in. to 72 in. discharge and up.

ALLIS-CHALMERS



YOU CAN DEPEND ON

Rome 60 Mining Cables



"P-105 BM" molded in the Neoprene sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes.

- The open braid around each conductor firmly interlocks conductors to sheath . . . prevents twisting, loosening and pulling.



The grounding conductor, solidly embedded in a Neoprene web, gives exceptional protection against "shorts" and mechanical injury . . . yet maintains flexibility and minimizes conductor distortion and fatigue.



to keep production up

Interlocking braid
prevents failure from twisting, bending or pulling of conductors

Now, more than ever, it is essential to keep production at a maximum. With costs spiraling, "down time" grows increasingly expensive. Yet, tens of thousands of dollars worth of equipment standing idle and costly man hours wasted are often the result of a single cable failure. That's where the extra quality of Rome 60 Mining Cables pays off.

With Rome 60 Mining Cables you don't have to worry about conductors twisting, pulling or loosening within the Neoprene sheath. A long-time feature of Rome 60 is a reinforcing braid interlocking . . . actually "gearing" individual conductors to the sheath and providing 360 degrees of balanced adhesion. Further, this open braid construction does not reduce sheath thickness . . . does not create thin spots.

Rome 60 Flat Twin (Parallel Duplex), Type G, for shuttle car serv-

ice, features a Neoprene webbing between power and grounding conductors, which unlike fibrous components, cannot rot, deteriorate or wick moisture. Note the integrated construction of the cable illustrated. The resiliency of Neoprene, compared with fibrous materials, provides higher impact resistance, as well as increased protection against short circuits. The absence of restraining fibrous "separators" results in maximum flexibility for fast reeling applications.

All Rome 60 Mining Cables are insulated with a special heat-resistant rubber compound suitable for operation at 75° C., thereby providing extra overload protection.

The Neoprene sheath is molded to a tire-like toughness. It is highly resistant to acids, alkalies, oils, abrasion and flame. It is made for long and tough service.

Copper wire mill products are a Controlled Material under N. P. A. Controlled Materials Plan. USE YOUR CMP ALLOTMENT.

IT COSTS LESS TO BUY THE BEST

ROME CABLE
Corporation

ROME • NEW YORK

TORRANCE • CALIFORNIA



A Wide Selection of Tough,
Dependable Rome 60 Mining
Cords and Cables:

- Type SO Portable Cords
- Single Conductor Locomotive Cables
- Concentric Mining Machine Cables
- Flat Twin (Parallel Duplex) Mining Machine Cables—Types W and G
- Multiple Conductor Portable Power Cables—Types W and G
- Shot Firing Cord
- Mine Power Distribution Cable
- Shovel and Dredge Cables

Let's look through the album together . . .

Your Atlas representative carries with him these days an album of "machine gun" photos of many blasts. Each blast illustrates a point and serves as a reminder of the principles that lie behind good blasting.

The photos in this album help answer some of the questions at the right—all of them timely, interesting, and important today.

Why not write or phone for a date? Or, plan to spend a pleasant and profitable hour looking through the album together the next time your Atlas representative calls.



Does a column of explosives shoot instantaneously?
Is the point of initiation important?

Which is the best point of initiation to get complete confinement of the explosives gases?

When does detonation from *top* of the hole have distinct advantages?

Under what conditions does detonation from the *bottom* of the hole improve results greatly?

What improvements in control, fragmentation, and reduction of noise can be obtained by milli-second delay detonation?

How can milli-second delays be used to best advantage?

ATLAS EXPLOSIVES



"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE
Offices in principal cities

STOP RUST!

with

RUST-OLEUM



Available in ALL COLORS,
Aluminum and White. Proved
Throughout Industry For Over 25 Years

Deep underground pipes, coal cars, machinery — tipplers and surface equipment — all rustable metal surfaces need RUST-OLEUM! The exclusive formula that resists fumes, moisture, weathering, most acids and chemicals! Goes on easily by brush, dip or spray . . . dries to a firm, decorative finish!

May be applied over surfaces already rusted after wirebrushing and scraping. Specify RUST-OLEUM to your painting contractor or maintenance department for new construction, maintenance or remodeling. Prompt delivery from Industrial Distributor stocks in principal cities. Write for complete literature — today!

RUST-OLEUM CORPORATION

2463 Oakton Street — Evanston, Illinois

FREE SURVEY: Place your rust problems in the hands of a RUST-OLEUM specialist. He will conduct a survey, including applications, specific tests and recommendations. No cost or obligation. See Sweets for catalog and nearest RUST-OLEUM distributor, or write for literature on your company letterhead!

**It's Easy To Get The Facts —
Clip This To Your Letterhead**



- We Have A Rust Problem — Have A Qualified Representative Call
- Free Survey
- Complete Literature
- Nearest RUST-OLEUM Source

Rope leads from

UPSON-WALTON



How to lubricate wire rope

- Each wire in a rope is a "live wire"—since it moves with respect to its neighboring wires every time the rope bends or flexes. This causes wear, which can be reduced by proper lubrication.

In an Upson-Walton rope every wire is lubricated as it is stranded—thus lubrication is built in. However, for long life this lubrication should be repeated periodically. Use a lubricant which:

- is commercially chemically neutral.
- can penetrate between the wires and strands and to the core of the rope.
- is adhesive enough not to be thrown off by vibration.
- will not either harden or soften under extremes in temperatures.

With proper care Upson-Walton wire rope will give you longer life, greater safety and greater economy. Use of the best materials and methods, and thorough testing are your assurance of quality. Specify Upson-Walton on your next job.

THE UPSON-WALTON CO.
CLEVELAND, OHIO

NEW YORK • CHICAGO • PITTSBURGH

wire rope • rope fittings
brattice cloth • tackle blocks

MATCH YOUR WIRE ROPE TO YOUR FITTINGS AND BLOCKS... ONLY UPSON WALTON OFFERS ALL THREE

LONGER ENGINE LIFE

because this lubricating oil also

CLEANS ENGINES

- and keeps them clean!

► For over 15 years . . . in all types of diesel and gasoline engines in rugged, heavy-duty service . . . Sinclair TENOL® has been doing an outstanding job. TENOL has proven it provides long periods of trouble-free operation at sustained high power output, with lowered upkeep costs.

Sinclair TENOL is not to be compared with many alleged "heavy-duty" oils. TENOL is the real thing! You can easily tell if an oil is actually "heavy-duty" . . . See if it is approved under new Military Specification MIL-O-2104. TENOL far surpasses this stringent Government standard!

Save your valuable equipment — phone your nearest Sinclair Representative or write direct to Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.

SINCLAIR

TENOL

prolongs engine life



For Low Maintenance Costs

- No more lacquering of pistons, cylinders, valves.
- TENOL keeps valves and rings from sticking.
- TENOL prevents clogging of oil pump screens and oil channels.
- With TENOL, engines stay clean — free from harmful sludge and carbon.
- TENOL does not thin out at high temperatures, flows freely at low temperatures.
- Low oil consumption with full power, with TENOL.
- TENOL prevents corrosive wear of bearings and other parts.
- TENOL eliminates foaming.

S-D "Automatic"

Adequate Surge Bin Are to Low Cost Coal Mining

**THIS COMBINATION HAS AS
MUCH TO DO WITH CUTTING
YOUR MINING AND PREPARATION
COSTS AS IT DOES IN REDUCING
YOUR HAULAGE COSTS!**

A continuous supply of coal from the face to the preparation plant is absolutely necessary to produce coal at the lowest possible cost. The only dependable way this can be accomplished is through the use of an adequate surge bin which will serve as a temporary storage for coal in transit. The only practical method of filling a surge bin is with Automatic Bottom Dumping Cars. This Surge Bin used with S-D "Automatic" Cars permits your mining operations and preparation plant to function independently of each other. For each to operate at the lowest possible cost, they must be carried on independently:

1. Any cleaning plant works best, and at the least cost, with an even continuous supply of coal. The Surge Bin continues to supply coal to the preparation plant when, for any cause, there is a delay at the face.
2. With an adequate surge bin, one shift operation of cleaning plant is often sufficient to take care of two shift operation of mine. Breakdowns or delays at the preparation plant need not stop mine production because the surge bin will take the coal until repairs are made.

One who has not observed automatic coal haulage cannot visualize the continuity and smoothness of the operation. The cars are loaded and hauled by locomotives in the usual manner. As the trip of cars approaches the head house, they pass over an automatic scale where the coal is weighed in motion. The trip moves on to large surge bin (see top photo at right) where the cars automatically lay down their load of coal without breakage and without hesitation.

S-D "Automatics" haul your coal, non-stop, as it is mined until the surge bin has been completely filled

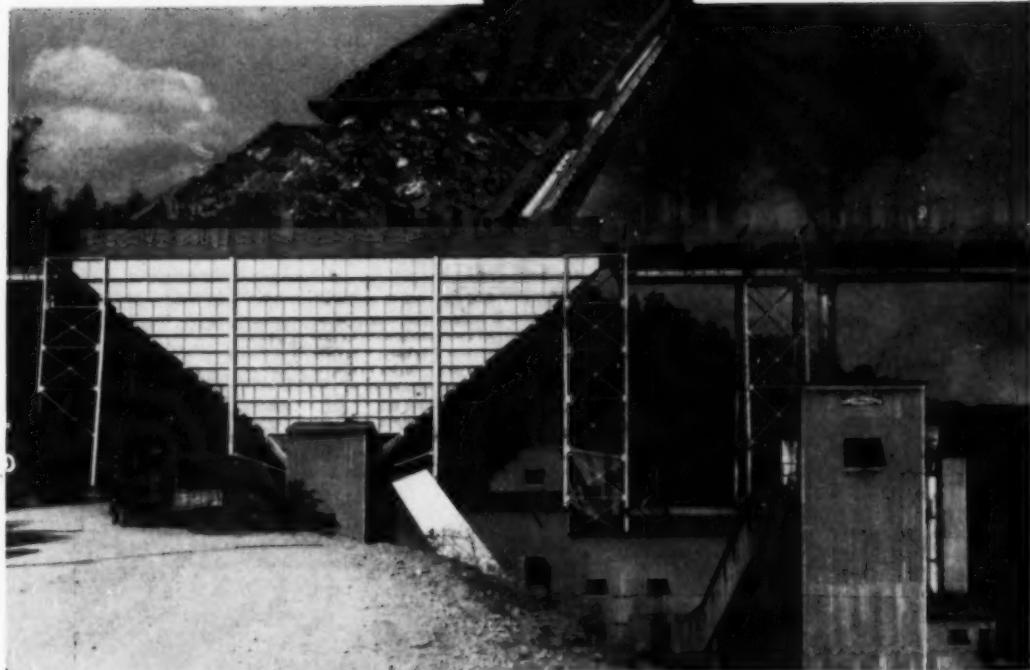


(see lower photo above) and the coal has been automatically leveled with the track from end to end. After dumping, the car doors are automatically closed and the trip runs smoothly back into the mine for reloading. Slate cars are dumped selectively at wells or slate bins enroute. The whole smooth, continuous operation is accomplished without stopping, with the same locomotive coupled to the same cars and with no delay.

The most economical means of filling a bin is with S-D "Automatic" Bottom Dumping Cars. Usually about

SANFORD-DAY IRON WORKS

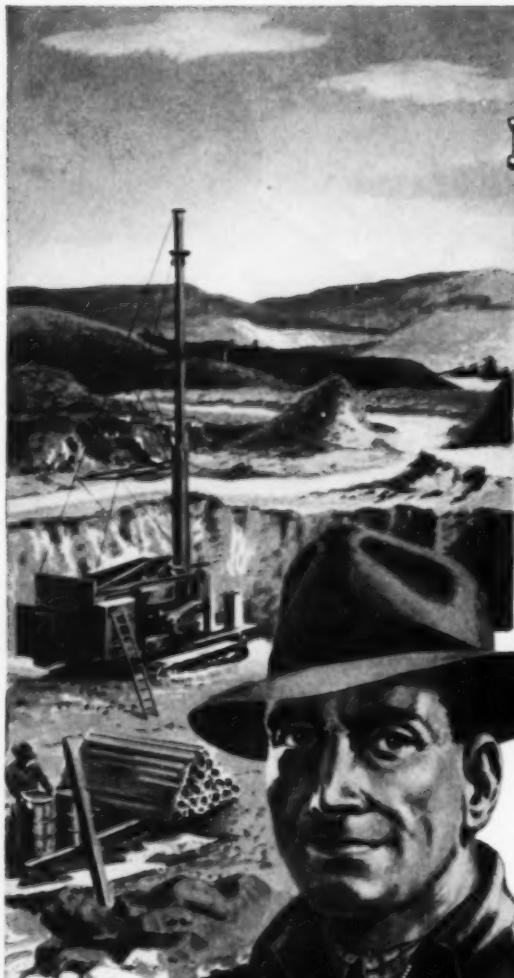
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MARCH, 1952

IVAN A. GIVEN, EDITOR

Still Needed—Action for Safety

MOST OF THE SIGNS at the time of this writing indicated that Congress would pass a mine-safety law, though it still was to be determined if it would be of the blank-check variety or would spell out federal standards in some detail. Incidentally, there was marked impatience in committee hearings and elsewhere with the suggestion that the states are doing or can do a real job and therefore should retain the responsibilities reflecting, in part, the fact that most members of Congress now consider the Constitution no more than an interesting historical document without bearing on any law they might consider passing. Equally marked impatience with arguments that legislation cannot bring about safety also reflected the conviction of the average Senator and Representative that his job is to pass laws, rather than not, even if those laws eliminate powers heretofore considered as reserved to the states.

Where would passage of a federal safety law

"with teeth" leave the coal producers? In many ways, their position would not be radically different, though they would be compelled to comply with a new set of rules and cope with a new enforcing agency. The basic problem, however, remains the same: creating a state of mind where every man, before he does anything, asks himself: "Is this safe?" There also would be no change in the benefits to be obtained from faster progress in safety.

Thus, coal still needs to accept leadership in safety and organize to get results. That the industry shares this belief is indicated by response to the *Coal Age* program summarized on p 76 of this issue. There is every reason to proceed on this basis forthwith. Operation under state and any new federal laws would be made much less burdensome, even tougher regulations could be avoided, and coal could cash in on the higher efficiency that inevitably accompanies maximum safety.

No Letup

CAPITAL EXPENDITURES for new plant and equipment, and for modernizing existing plants and processes, is considered by practically all authorities as the No. 1 indicator of the health and activity of the industrial machine on which coal depends for so much of its business. For that reason, plans for capital expenditures are a significant yardstick for assessing the business climate coal will enjoy, even though an equally significant one is the level at which the industrial machine operates.

What, therefore, is the picture for 1952? For capital expenditures, 1952 will be a record year, with the total 13% ahead of any other year in history, according to the results of the McGraw-Hill survey of plans recently completed. And as far ahead as 1955, the planned expenditures are well up to figures for other recent years. And with all signs indicating that the industrial plant will run at full

capacity in 1952, the picture becomes doubly favorable for coal—if it takes full advantage of its opportunity—not only this year but in the other years of the future.

Plus Values

TIME MARCHES ON, and with it new developments in a wide variety of fields. Now, transistors and cement additives are among the things that are coming to the fore. The transistor is described as "the most exciting new development in electronics," while new cement additives provide a large increase in the strength of concrete. What is the significance to the coalman? For one thing, flyash is one possible source of germanium, on which the transistor is based, and flyash already is finding wide use as a cement additive. So, coal can cite at least two new customer benefits in a significant part of its selling.

Safer Mines



Wide World

What Men Say About a Federal Mine Safety Law

President Truman
He urges federal control.

lessly, somewhere in this country. We have got to put a stop to it. The miners and their families are entitled to protection by their Government. It is our plain duty to keep the coal mines just as safe as human skill and effort can make them."

Letter to Interior Secretary Chapman, Jan. 22.

Secretary Chapman
He wants it, and wants it made tough.

regulations promulgated by the Secretary . . . a misdemeanor; and to provide that if a violation of the regulations results in a condition that constitutes an imminent danger to the life or safety of employees in the mine, failure to withdraw the men from the dangerous area and to keep them out of it until a certificate of correction has been issued by the Secretary, or his representatives, will constitute a felony."

Statement to Senate subcommittee, Jan. 24.

John L. Lewis
He demands it . . . Now.

"I cannot urge too strongly that the Congress take action on these [mine-safety] bills at once. Almost every day, miners are being killed need-

forcement powers to inspectors of the federal government and responsibility for defining sound mine practice . . . I hope that out of this tragedy will come a public demand for enactment of improved standards through increased powers for federal mine inspectors."

Statements following the West Frankfort disaster.

Director J. J. Forbes,
U.S. Bureau of Mines

He asks for it, but . . .

"The terrible recurrent disasters . . . testify to the need for a reasonable, modern safety code that is adequately enforced. At this time, I wish to go on record as favoring the legislation proposed by the Secretary of the Interior empowering him to require compliance with safety regulations in coal mines. . . . Such legislation, if enacted, would impose a tremendous responsibility on the federal inspectors to act wisely and without fear or favor. I wish to make it clear that the enactment of federal coal-mine safety legislation will not eliminate all coal-mine accidents."

Statement to the Senate subcommittee, Jan. 24.

Federal inspectors

They're not eager to take it on.

Federal inspectors aren't 100% sold on police powers for their work. In recent talks with *Coal Age* editors, some have expressed reluctance to take on the responsibility of closing a mine or letting it stay open. They say that at least three inspectors ought to be in on every decision to close or reopen.

.....Can Congress Do the Job?

Here's the latest word on the mine-safety controversy.

You'll get some surprises in what the men with the biggest stake in safety say.

They point out also that police powers will force them to prosecute violators. They don't want to prosecute. They'd rather go along with training and cooperation which, they say, has produced good results thus far.

But if a police-power law is passed, they want its terms clear and unmistakable—no loose terms like "imminent danger."

One inspector predicts that USBM branch-office chiefs will have to hold a tight check-rein on their men. The story is that some of them may be out to "get" operators and superintendents who, in former years, objected to being cited for violations.

Here's the way other federal inspectors feel about it:

1. "I honestly believe a new federal law will help if carried out with judgment. The power to close a mine also would help if likewise exercised with judgment. Above all, we need more education and training."

2. "I think a law properly administered would help. We can't get too dictatorial but teeth would help sometimes with the tough customers. Closing? There again is the problem. If inspectors are given the responsibility, they should have the right to make the rules. Personally, I think if we can get safety without law, it's the American way. But for some reason—politics or something—we aren't getting it. Safety education and training—there's our tremendous need. And it pays off."

3. "Police power? It depends. I'm a states righter myself and feel police power isn't necessary if the states do a good job. With police power, there's always the possibility of abuse and the inspector is on the spot and might lose force if he lost a legal battle. If we have to have a law, I believe it should deal with catastrophic cases only. Conditions have improved and cooperation is excellent. The next big step in safety will come by education of men who have the accidents."

State Inspectors

They see danger in federal law.

asked West Virginia and Illinois men in mid-February.

Here's Question No. 1:

Do you think coal mining would be safer if the Bureau of Mines had the power to make safety rules?

West Virginia inspectors answered Question 1 this way:

"No. Because of the many dangers in coal mines, it would be hard to legislate and enforce too many laws covering safety of miners. Because mining conditions differ from mine to mine and county to county, it would be hard to make rules for every coal mine. We can't compare work and safety in mines with work and safety in factories. You can make rules for one specific type of manufacturing. But it's impossible to apply this same yardstick to coal mining. Nobody could make a safety rule that applies to every coal mine in the country."

Last-minute opinion of state mine inspectors, revealed in the following paragraphs, comes from two questions *Coal Age* editors

"No. Since the Bureau of Mines was set up for doing research and making reports on it, it would be worth more under the old system to the mining industry and the public as a whole. The states are the cornerstone of our government. I believe that if we inject certain laws that tend to infringe on states' rights, they would be a handicap on both the state and the federal government."

Illinois inspectors answered Question 1 this way:

"No. The mines could be no safer under federal control than under state control. No mine is ever safer than the men in the mine, regardless of who the inspectors are. We have too much control in Washington now. I favor leaving control with the states. It's not who inspects the mines—it's the men who work in the mines. Mines in different states are laid out differently and I think Illinois inspectors know more about Illinois mines. Some systems and practices won't work in all mines. State inspectors must qualify under Illinois law before they can serve as inspectors. Federal inspectors are not required to qualify under Illinois law."

"No. The state can enforce the law as well as the federal. The state mining laws should be revised. Some of them have been on the books since the days when mules were used in mines."

Here's Question No. 2:

If the Bureau of Mines had the power to make safety rules and if federal inspectors had the power to close mines, how would it affect your job and your responsibility as a state mine inspector?

Illinois inspectors see it like this:

"If the Bureau of Mines had the power, it would be up to the federal inspectors. We would have no need for state inspectors. We do not need two sets of inspectors. The federal could not enforce safety regulations any better than can the state."

"It would make it better for us since we would not have all the responsibility. Federal inspectors, working through the mine safety committee, now have as much power to call men out of the mine as does the state."

West Virginia inspectors feel this way:

"There would have to be new legislation and changes in our state law before it would affect either my job or my responsibility as a state mine inspector. It would be difficult to do these things because it would be taking away some of the rights of the individual states. Each state can make its own laws and regulations, and in our state they are made more applicable to conditions. Geographically, the Bureau of Mines covers more territory than any of the states and their inspectors are not as familiar with conditions in various sections of this state as are the state inspectors. The federal inspectors, most of whom are from Utah, Indiana, Pennsylvania, Ohio and Kentucky, do not know the conditions familiar to this state or any particular section and therefore are not as well qualified as state inspectors. The inspectors in this state are selected to inspect mines in the sections of the

Here Are the Facts About the

Who Will Make the Rules	What the Rules Will Cover	Who Can Close Mines
Neely-Price bill (SR 1310, HR 268)	Secretary of the Interior acting through USBM, which will promulgate rules.	Roof control, machines, equipment, explosives, mining methods, ventilation, gas, dust inspections.
Interior Secretary Chapman's amendments	Secretary of the Interior acting through USBM. Rules will have the force of law.	A federal inspector, by oral or written order, if he finds "imminent danger."
Northern operator's amendments to Neely-Price bill	Congress.	Matters covered by the existing Federal Mine Safety Code.

state where they have had their mining experience and therefore know the mine conditions in that section better than a man from another state. Even so, the state inspector must often confer with some veteran worker or foreman around the mine to find out how long a specific practice has been in effect and the safety of it before making a decision."

"It is hard to serve two masters. You cannot take two codes and inspect coal mines where at the present time opinions differ on various aspects of mine safety. I do think that with the setup in a coal-producing state with a department of mines taken out of politics and put under civil service, there is no question that safety could be carried out to a greater degree than with both federal and state trying to inspect the coal mines with two sets of codes. There would be confusion that would be detrimental to the coal-mining industry, as well as to the two inspection services."

The Miners

Some don't want federal control—others do.

Lack of unanimity about a federal mine-safety law. Twenty-four miners—10 in Illinois and 14 in West Virginia—answered this question:

Do you think coal mining would be safer if the Bureau of Mines had the power to make safety rules?

In Illinois, 3 of the 10 said "No"; in West Virginia, 4 of the 14 said "No."

A Chicago, Wilmington & Franklin miner at West Frankfort, Ill., explained his "No" vote this way: "I believe the state is just as capable of administering mine-safety regulations as is the U.S. Bureau. Conditions are different in each state, and it is my opinion that inspectors from the states in which the mines they inspect are located are more capable of supervising safety in those mines with which they are familiar. I believe they could do a better job. Federal inspectors from other states are not familiar with our conditions."

Another West Frankfort miner, not working for C. W. & F., explained his "Yes" vote this way: "There would be less political and local pressure on the federal inspectors. The federal inspectors would be more free to discharge their duties and insist upon compliance with their recommendations."

Behind the scenes among the miners themselves—the men with the biggest stake in mine safety—*Coal Age* interviewers found a surprising

In West Virginia, a pump man expressed his opposition to Bureau-made safety rules this way: "I don't think the men in Washington have enough experience in and around the mines to make the safety rules. You must have a little experience in the coal mines to know what is best."

A loading-machine man in West Virginia put it a little differently when he voted "No": "It should be a cooperative proposition between the Bureau of Mines, the state departments of mines, management and union."

Even those miners who answered "Yes" to the question weren't 100% sure Bureau-made laws would do the job.

For instance, a West Virginia safety committeeman and conveyor loader put it this way: "If the law now in Congress gives the Bureau more power passed, it would make the mines safe. But I think the mines would be safer if they left it in the hands of the UMWA, because the miners know the conditions of the mines and would know what to do."

And a West Virginia cutter operator said, "Yes, but we should put in force the laws and rules we now have."

The second question *Coal Age* asked miners was this:

Do you think an inspector of the Bureau should have the power to order men out of the mine if he thinks the mine is unsafe?

West Virginia and Illinois miners voted "Yes" 23 to 1. A West Virginia miner expressed it this way: "Yes. Even the individual miner should have the power to do some-

How We Found Out

Straight from the coal fields, told exclusively in these pages, come the safety views of the men who know safety best—miners, inspectors and operators.

To bring you these on-the-scene opinions, *Coal Age* asked newspapermen in West Frankfort, Ill., and Beckley, W.Va., to quiz miners and state inspectors. The newsmen sped their answers to us in time for this issue. The miners' views on a federal safety law are on this page; on p. 73, their views on safety efforts of companies and the union. You'll find the opinions of state inspectors on p. 71.

To get the views of federal inspectors, *Coal Age* editors themselves set up telephone and face-to-face interviews. You'll read what the editors found out on p. 71.

Operators' opinions, stated in response to *Coal Age's* Four-Point Plan for Safety in the February issue, are published on p. 73 and pp. 76-78.

Neely-Price Mine-Safety Bill

Who Can Reopen Mines

A federal inspector, certifying correction of violation.

Secretary of the Interior or his representatives, who will certify removal of danger.

Director, USBM, following re-inspection; U.S. District Court upon proof that order was unfounded or danger has been eliminated.

How to Appeal A Closing

Ask the Director, USBM, for a re-inspection. He will send a different inspector. If mine is safe, Director will permit reopening.

Ask Director, USBM, for re-inspection by three inspectors; or petition U.S. District Court for annulment or revision of order, appealing if necessary to U.S. Circuit or U.S. Supreme Court.

Who Gets Punished, And How

Operator failing to obey closing order is guilty of a misdemeanor—\$2,000 fine or 6 mo imprisonment, or both.

Operators violating rules are guilty of a misdemeanor; operators failing to withdraw men from "imminent danger" are guilty of felony.

Operator ignoring order to withdraw men is guilty of a misdemeanor and subject to \$2,000 fine or 6 mo imprisonment, or both.

thing about ordering the miners out of the mine if he finds a condition that is definitely unsafe."

Another put it like this: "Our safety committee should have this power, too, but if we pull the men out now it is considered a strike. When we do pull them out, we are condemned for it and all we are trying to do is protect the men."

"The inspectors," a conveyor loader said, "are pretty level-headed men and I don't think they would go off half-cocked and close a mine for little or no reason."

One C., W. & F. miner, voting "Yes," said he thought both the Bureau and the State Department of Mines & Minerals should have that authority. Another wanted the "safety first" men also to have that power. Still another added an "If"—if the local mine safety committee consents.

The lone dissenter, an Illinois miner not working for C., W. & F., voted "No" because, he said, "I think any inspector who finds a condition that is unsafe should report it to the operators. Federal inspectors are no more capable than our own men."

Mine Operators

One operator stated his position this way:

"To me the real problem of the moment is whether the enforcement of regulations is a state or federal responsibility. We might compare it with the patrolling of our highways. Should this be done by state or federal officers? Public information and driver training are of the same prime importance as the coal industry safety programs. However, in both cases we are a long way from being able to do away with public regulation. A federal agency is advisable and necessary for research, testing, setting standards, etc.—in general, such work as the Bureau of Mines has been doing so excellently over the past years. The setting up of the laws, rules and regulations and their enforcement is the responsibility of the state."

Other operators declared:

"This, of course, will commence a harassment program through the federal inspectors to endeavor to set up detailed rules of procedure which will not fit into the varying conditions which govern mining in the different states and different localities. . . . If this is done it would indicate to me that the coal industry is headed for federal control and, no doubt, federal operation."

"I am certainly against any federal legislation which

will take over the job that should be done by the states. . . . We are working very closely with some of the members of Congress. We know that the Senate would possibly pass the Neely bill, but we have every reason to feel that we might be able to stave it off in the House or at least modify it so it would not put the police effect into any federal mine bill that might be enacted."

But some operators will accept federal control if it's modified.

One executive put his view in these words:

"Any legislation that is enacted for the safety of mine personnel would be more effective if it is statutory instead of regulatory. Where an inspector is given power to promulgate rules, there is too great possibility of the rules and regulations changing from time to time as the inspectors are moved."

And a spokesman said this for his constituents:

"The coal operators for whom I speak [representing well over 100,000,000 tons of bituminous] are not opposed to legislation by Congress empowering the U. S. Bureau of Mines to enforce provisions of federal mine safety laws. They do not believe that federal mine safety laws and federal enforcement of such laws will prevent all mine disasters. But they do not believe that sound federal mine-safety laws and federal enforcement of them will injuriously affect mine safety. And I am authorized to say that they are willing to support the idea that the U. S. Bureau of Mines should be given power to enforce federal mine-safety laws. But they oppose the idea that the power to write the federal mine-safety laws should be delegated by Congress to any federal administrative agency. They urge that Congress itself ought to enact appropriate mine-safety laws. They also urge that laws which Congress might pass placing enforcement powers in the Bureau of Mines should provide adequate appeals from and reviews of orders to close mines."

An association secretary—He wants no part of it.

"I do not think federal inspectors with a federal law with teeth in it would in any way solve safety problems in coal mines. On the contrary,

I think their duties will not only overlap the duties of state inspectors but will inevitably destroy the effectiveness of state supervision of safety in coal mines. Naturally, state supervision and responsibility will be less and eventually all responsibility will be placed in federal inspectors."

Law Alone Can't Make Mines Safe

Suppose Congress passes a mine-safety law. Will the mines then be safe? The answer is "No." It takes a lot more than law to save men's lives and make men do the right thing. A law won't even stop smoking.

DON'T LOOK FOR AN END to death and injury if Congress makes the Neely-Price bill into law. Even USBM Director Forbes told senators that the bill won't stop accidents.

Mr. Forbes was saying what all mining men know. Like him, they know that safety lies in the hearts and minds of men and that rules won't work unless men want them to. Here's why a federal law won't stop accidents:

1. Too many men are bull-headed, careless.

A law won't do much to make these men work safely. Any miner who wants to smoke can sneak off around a pillar. If a tripriider wants to jump off a moving trip, he can jump. A cutting-machine man can be too cocksure to test the roof or too lazy to take down loose slate. The result: He gambles his own life and endangers his buddies.

2. A law won't make every operator go all out.

Some operators think safety costs money—too much money. They don't stop to think that accidents cost more than safety and a safe mine is an efficient mine. A few are indifferent, or willing to gamble that trouble won't come their way. That's why they ignore inspectors' suggestions and put off correcting violations. Too often, their luck runs out.

3. A law won't make the union beef up safety.

The union often is on the side of union solidarity, not on the side of safety. That's why companies and enforcement officers sometimes have to turn to outsiders to get backing for their safety efforts. The truth is, they should get backing from the union.

For instance, several days of strikes not long ago plagued a Kentucky mine. The reason was that officials searched workers underground for smoking materials and fired five men for breaking the rules. Work started up



again only after the five men, promising not to smoke, got their jobs back. And it took a ruling from the attorney-general to establish the right to search.

4. A law won't make all mines alike.

A single law can't cover safety in mines that differ from state to state and even from section to section.

In thickness, seams vary from 3 to over 50 ft. Some mines are gassy, others aren't. And gas suddenly appears in some mines that were thought non-gassy. That's what happened at Carpentertown No. 2.

5. A federal law can't cover local conditions.

Differences among existing safety laws reflect the efforts of mine-safety men to write rules that fit their own needs. What's safe in one place may be unsafe elsewhere.

Here are a few samples of conflicting laws:

The federal code requires rockdusting to within 80 ft of the faces of rooms and entries. West Virginia law makes it to within 100 ft of the face; Alabama, to within 40 ft of the face, or closer if necessary.

The federal code requires a minimum of 6,000 cfm of air reaching the last open crosscut in a pair or set of entries. Pennsylvania requires a minimum of 200 cfm per man on each split; Alabama, 150 cfm per man in gassy mines and 100 cfm per man in non-gassy mines.

On-shift blasting with explosives is permitted in West Virginia. It's not permitted in Illinois.

Under the federal code, 0.25% of methane classifies a mine as gassy. In Illinois, it takes 0.75%.

6. Existing federal law obstructs training.

Under the Fair Labor Standards Act, the union demanded pay for miners taking safety training after working hours. That was a body blow to training. The result: A sharp drop in safety and rescue courses offered by companies and, likewise, a decline in the number of Joseph A. Holmes safety chapters among miners' local unions.

Miners Speak Up on Safety

Straight from miners in Illinois and West Virginia come opinions of the men themselves about what's being done to make mines safe . . . and what remains to be done.

COAL COMPANIES and the union do a lot to make mining safer. That's what most miners say. *Coal Age* found that out by questioning 24 rank-and-file workers in West Frankfort, Ill., and Beckley, W. Va.

Here are two questions miners answered:

1. What does your company do to promote safety? Nothing? A little? A lot?

2. What does your union do to promote safety? Nothing? A little? A lot?

Ten out of 14 miners in West Virginia and 6 out of 10 in West Frankfort said their companies are doing a lot. Nine out of 14 in West Virginia and 5 out of 10 in West Frankfort reported that their unions are doing a lot. No miner accused his company or his union of doing nothing.

The miners' comments make good reading. Here's what they say about their companies:

"Our company does everything it can to help promote safety by listening to the men's suggestions and, if they are good, putting them into effect. It is a cooperative project at this mine, with a great deal of cooperation between miners and supervisors. This is the only way to have safety."

"The company does a lot of education in safety. They could put safer equipment in the mine to go with the education."

"The company attempts to keep plenty of air going into the working places and the mine is well rockdusted. The company tries always to comply with safety recommendations. I believe the company is interested in the safety of the men and attempts to protect them."

"Safest company I've ever worked for. The company attempts to abide by the state laws and conform to the Bureau safety code as near as possible."

"The company sponsors safety courses at which the men are instructed in the detection of gas, in first aid and in how to protect themselves in an emergency."

"The company does a lot to promote safety but, through oversight and hurry, many important factors are often neglected."

"A little. Some rockdusting but not enough. They clean up the working places and load some dust, but not enough. They use some chloride to keep dust down."

"The company tries to do a lot. They pay a lot of money for safety but very little is accomplished with a lot of wasted effort."

"The company talks a heap about safety but does very little."

On the union side, the miners tend to credit their local unions with more and better safety work than their district union headquarters. Here's the way they see their union's job:

"The union has its own mine-safety committee, the

members of which are paid by the union to inspect the mine during the shift and report to the management any dangerous condition. My company acts promptly on recommendations of the safety committee."

"The union, on a local level, does the most toward safety. This union doesn't go to district headquarters with its problems but works them out with the management. District union headquarters helps by offering suggestions for new safety angles."

"The local unions accomplish the most toward promoting safety. The district union headquarters does little toward promoting safety. All they do is sit around and try to think of things for us to do."

"The district union headquarters does very little. Our local union tries to do everything it can to promote safety."

"The union does little toward safety because they are very restricted in their powers. The district headquarters gives out a lot of information to let us know what to do but all the local unions can do is suggest to the management. We cannot force them to do anything unless we strike."

"The union does what it can to promote safety but there isn't very much it can do."

"The union tries to do a lot but accomplishes very little. We need the cooperation of the company, and we very seldom get it."

"The union does a lot but the results are a combination of efforts by the district headquarters, the mine management and the local union."

"The union does very little to promote safety."

What is still needed to make mines safe?

Rank-and-file miners put their finger on several weak spots. Here's what they say:

"The best way to improve safety in this or any other mine is to get the miners to cooperate 100% with the management in finding safer methods of mining."

"The best way to improve safety at our mine is to encourage the miners at each local union meeting to think and act safely."

"Take the mining rules we now have and enforce them. Try and educate the miners to think safety all the time."

"More education in safety for the miners is the answer to mine safety. The companies, state department of mines and federal inspectors should push safety training, especially in first aid."

"Closer inspection of the working places for roof control. More miners are killed in roof falls than any other way and I think it could be prevented, or cut down, if the timbering standards were maintained."

"If everything is carried out that is paid for as far as safety is concerned and if everybody would do what they should in the way they should do it, our mine would be safe. If everybody met the safety requirements now in effect, we wouldn't have men killed and injured. We also need good cooperation between the men and bosses to help get safety."

"The individual miner should take more interest in his own safety."

"The foremen should be forced to abide by the mine laws, to correct violations, and then there wouldn't be so much danger in our mine."

"We need to teach our men to be more careful. Just a little carelessness and this mine would blow up."

"Putting all our heads together is sure to have better results toward making coal mining safer."

Can Anything Make Mines Safe?

Mine safety is a stormy issue. This issue will not—and should not—die down.

Three facts stand out in the six preceding pages of this article. These facts are:

1. There's disagreement wherever you turn within the industry—to operators, inspectors, and miners themselves—about how much good a federal mine-safety law will do.

2. But everybody agrees that something must be done—and done now.

3. And all agree that safety is everybody's business—no single law, no one group within or outside the industry can do the job alone.

Is there, then, any program for safety that comes to grips with the realities of the issue?

Coal Age believes it has such a program.



Will the *Coal Age* Plan for Safety work?

Coal operators say . . .

"In the right direction"

"Your program is very well presented and you are certainly correct when you say that, even if damaging federal legislation is averted at this time, another disaster could bring about its adoption."

"An industry organization such as you suggest is in the right direction. You, of course, are familiar with what has been done by the safety director of the National Coal Association. I realize that what you are suggesting is much more extensive and would undoubtedly have dramatic results if followed out."

J. A. Willis Jr., Vice President
Coalburgh-Kanawha Mining Co., Coalburgh, W. Va.

"Very timely"

"I believe your program to be very timely."

"The safety program of this company now embraces many of the ideas advanced in your editorial. We believe it is not enough to have a sound declaration of policy in the matter of mine safety. It requires intensified activity every day in the week and every week in the year and a determination that vigilance in support of a sound safety program cannot be relaxed. If but one life is saved by a sound safety program, the result is still worth all the effort."

Edward A. Lynch, Director of Personnel
Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.

"A little bit late"

"I am afraid you are a little bit late in thinking that the coal industry can or will do this. The record is perfectly clear that as long as the coal industry thinks it can get by without spending a great deal of money on safety, it will continue to do so. The great reluctance to go on a permissible basis even with this as a part of the contract should point out to you the impossibility of a united industry forcing this issue."

C. J. Potter, President
Rochester & Pittsburgh Coal Co., Indiana, Pa.

"Sound thinking . . . but . . ."

"I think all the points you have made are well taken and based on sound thinking with the possible exception of one."

"In regard to setting up an industry-wide safety organization, I personally cannot convince myself that this would achieve the results that you seem to anticipate. There are at the present time a good many safety organizations of one kind and another available and being used to varying degrees by the industry. . . .

"Generally, I believe most operators, miners and inspection agencies know the essential factors that will further reduce our accidents. Therefore I doubt whether additional planning is as necessary as really getting down to work and putting into effect the things we already know. I think you hit the nail on the head when you said that the operators and the miners (two groups most vitally interested in safety) need to apply themselves more to the problem and do the things they know should be done."

"The above comments are strictly my own personal opinions."

D. L. McElroy, Vice President
Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.

"Each doing his part"

"Your suggestion is a very good one. I think we all know, in the coal industry, that we will never have safety through legislation but through cooperative training with the miner and employer each doing his part."

Isaac Lewis, President
Quality Excelsior Coal Co., Greenwood, Ark.

"One code, one body of inspectors"

"I agree quite generally with what you have to say. I believe the well-operated coal companies generally strive to go along with suggestions made by either federal or state inspectors. It is my feeling that when a code of rules

A Four-Point Plan for Safety

In February, *Coal Age* presented this plan:

1. ACCEPT LEADERSHIP—The rewards of safety lie in human values and in cash. They are worth the effort. Thus leadership in safety belongs in the industry—not in some outside organization. The industry should be writing the safety codes and laws and seeing to their adoption and observance.

2. ORGANIZE FOR RESULTS—An industry organization would be a potent force for safety. An industry safety organization might be set up in each producing region, with a national organization over all. The association could develop codes of safe practices, provide consulting service, keep an eye on safety conditions and work with law-making bodies and others interested in safety.

3. BRING IN THE MINER—Mostly, the miner is passive about safety. But if sold on safety, he can contribute immeasurably to an industry or individual program. Mine workers and their organization should take an active and constructive part and the industry should welcome their participation.

4. SUPPORT SAFETY AGENCIES—Coal men should take an interest in the personnel and operation of state inspection and safety agencies. The industry should back appropriations for personnel and facilities to do a real job of research, education and training and should spend money of its own for achieving safety. The principle is: the more hands, the lighter the work.

is provided, it should be applied without favor to all mining operations assuming, of course, that the code will accomplish the maximum benefit for safety with a minimum dislocation for the industry.

"It is my belief that the industry should have only one such code, and this code should be administered by only one body of inspectors. This body should be free from all political taint with only the welfare of the employees of the industry in mind.

The safety effort should be enforced by labor as well as management. I am reminded along this line of a considerable number of instances where a few men are detected smoking or carrying smoking materials into gassy mines where the majority of the men comply with the rules. . . . It is always disconcerting to the management to find some of the buddies of the guilty men making strong efforts to ameliorate the punishment meted out to the offenders.

"From long experience and contact with many segments of the industry, I am sure that the present improved results stem from a joint effort to bring about safe conditions in the coal mines of the United States."

James Prendergast, Vice President
Susquehanna Collieries Div., Cleveland, Ohio

"I wonder if there's time"

"I am somewhat fearful that the time is past when the coal industry itself will be able to prevent a more drastic regulation through federal law giving the Bureau of Mines inspectors police power. This, of course, will commence a harassment program through the federal inspectors to endeavor to set up detailed rules of procedure through national legislation which will not fit into the varying conditions which govern mining in the different states and different localities.

"I am wondering if the various states have sufficient time at this late date to organize a program acceptable to the public and one which would prevent the Congress of the United States from passing regulatory laws giving the Bureau of Mines, as federal agent, police power. If this is done it would indicate to me that the coal industry as a whole is headed for federal control and, no doubt, federal operation.

"I am confident that the coal industry will be better

able to control its affairs and operate safer properties without federal control. However, I believe you realize that radical changes are necessary in ventilating and operating gaseous mines and that if it is possible at this late date to check the trend toward federal control it will be necessary for the coal industry in each state to organize itself quickly and support state laws, setting up committees and enforcement agencies within the state. However, to secure the time for each state to do this, it no doubt would be necessary for the coal industry as a whole to take the position that if federal legislation is passed by this Congress, the enforcement agencies should be set up outside the present Bureau of Mines and the agencies so set up should be representative of the different coal fields."

I. N. Bayless, President
Union Pacific Coal Co., Rock Springs, Wyo.

"Show the public"

"There is no question in my mind regarding the merit of your suggestions and this may be the way to show the public the real interest which the coal industry has in safety. As you know, many of the larger companies have shown this interest and have spent a great deal of money, but others have not shown the interest which they should have.

"Whether or not any action of this kind will stave off the federal mine bill is questionable, but I am certainly against any federal legislation which will take over the job that should be done by the states. It might be that we can get the federal legislation held off but, if we can't, we will have to do the next best thing of modifying it to the extent that the states will still have the responsibility for the inspection of our mines. . . ."

R. E. Salvati, President
Island Creek Coal Co., Huntington, W. Va.

"Vigor and imagination"

"I believe that such a program is necessary and that it must be executed with enough vigor and imagination both to effect safer coal mining and to appeal to the public.

"It seems to me that the ramifications of the industry require that such a program be carefully analyzed and planned. Being in the strip-mining business, naturally I

What coal men think about the Coal Age Plan for Safety . . .

feel that the problem confronting our section of the industry is neither so pressing nor so great as confronts deep mining, but at the same time I realize that we all are likely to become enmeshed by confining regulations, the enforcement of which might not always be in friendly hands.

"Also, the situation confronting deep mining varies greatly. The frequency and severity of accidents is greater

in those areas where dangerous gases are encountered underground. It seems to me that some sort of regulation by the industry should be immediately concentrated within those areas."

L. M. Cooley, Managing Partner
Edna Coal Co., Denver, Colo.

Association men say . . .

"Needed—research"

"I am very much in agreement with the general plan included in your proposal and believe that it is a good story to give to the industry. It certainly is true that the industry as a whole has not been in the forefront with respect to the promotion of mine safety insofar as publicity is concerned, and I believe that much can be done to improve the situation in that respect. An industry-sponsored organization specifically charged with promotion of mine safety should produce some good results in the promotion of safety as well as in the improvement of the position in the opinion of the public.

"One point, however, comes to mind which has to do with a sponsorship of research work related to safety in coal mines. It seems that the industry has permitted public agencies to dominate that phase almost to the exclusion of the industry itself. There are a great many problems associated with mine safety that are worthy of intensive study and which it would be very much to the credit of the industry to investigate under its own sponsorship. Some of the recent disasters in coal mines . . . indicate the need for further study of the accumulation of methane in coal mines. Some of our more recent developments in mining methods bring to light certain problems with respect to methane liberation and ventilation of coal mines that had not existed previously. Of all groups, the industry itself should take the most prominent position in their investigation.

"It stands to reason that if the industry is to accept leadership in the safety program, its influence should extend to all phases of the program, including the research that may be necessary. I do not believe that we can be completely dependent on public agencies for a part of the program and expect to dominate the remainder."

G. R. Spindler, Secretary-Treasurer
West Virginia Coal Mining Institute, Morgantown, W. Va.

"Dual leaders—management and union"

The reduction of accidents and deaths in and about the coal mines is the dual responsibility of management and labor working together. If top labor leaders prevent the disciplining of their members for violating safety rules and regulations, then the whole program of mine safety is jeopardized. When the UMWA does not allow the penalizing and disciplining of individual violations of safety rules, all the federal or state or company inspectors cannot guarantee safety in a coal mine. I would say that 90% of all mine accidents are preventable.

"Safety in coal mines is a long, persistent and never-ending problem of education by a qualified safety-minded management from the top down. It must never be relaxed . . .

"Leadership and aggressive action on the part of the industry should be accepted by all in the industry. However, it will not produce results unless somehow and sometime dual leadership between union officials and top management is set up and disciplinary action on safety violators is taken that is agreeable to both the UMWA and the coal industry.

"I think you are taking a step in the right direction. The industry and the union together, to my way of thinking, could accomplish more than all the law that might possibly be enacted."

Ernest B. Agee, Secretary-Treasurer
Indiana Coal Producers Association, Terre Haute, Ind.

"Responsive leadership"

"The coal industry . . . through organization, education and effort has made a showing which is indeed complimentary.

"In the New River field we have a New River district safety committee composed of safety directors representing a cross-section of the area. This committee meets monthly, with papers presented on ventilation, haulage, mechanical mining, roof falls, gases, etc., followed by open forum and discussion on prevention of accidents.

"As educational work, at its April meeting . . . the safety committee acting as a panel will invite foremen, superintendents, executive officials, together with their wives. In addition, high school seniors will be present.

"We are trying to include safety as an essential part of the high school curriculum in West Virginia.

"Safety is being alert, protecting a fellow worker, educating, exercising leadership and being responsive to mining laws, safety rules and safety regulations. That is our New River plan for an organization to make such leadership responsive to accident curtailment."

S. C. Higgins, Secretary
New River Coal Operators Association, Mt. Hope, W. Va.

"Cannot find any fault"

"I certainly cannot find any fault with your plan to suggest an industry safety organization to initiate, promote and motivate safety within our industry. I feel quite sure that your plan will receive the approval of the industry.

"We all know that legislation will not eliminate nor prevent accidents. Education and training will do more to solve accident prevention than any other plan."

R. T. Laing, Executive Director and Secretary
Central Pennsylvania Coal Producers' Association,
Altoona, Pa.

"Possibly we are too late"

"I am somewhat of the feeling that possibly we are too late to salvage much out of today's situation, particularly with respect to legislation.

"I rather agree with your Point No. 2—that organizing for results is necessary—but with the diversity of thinking in our industry and the large number of companies, it is going to be a particularly tough task for the coal industry to function as a unit. Apparently other groups or associations are in somewhat the same position we are in, because the National Safety Council is trying to stimulate association safety programs . . .

"With respect to your Point No. 3—bringing in the miner—I think here we have our biggest problem. I feel sure that we are not going to get much cooperation from

the men because of the attitude of their union representatives. I know that the Safety Division of the union has hopes and plans to increase the effectiveness of safety work but they are stymied in their work.

"Please don't think that I feel the situation is hopeless,

but to be quite frank I cannot see where we can make too much progress. Of course, keeping up the pounding . . . will help break down the resistance.

Earl Maize, Director, Safety Division
National Coal Association, Washington, D.C.

Mining department heads feel this way . . .

"On the right track"

"I think you are pretty much on the right track.

"Along with your suggestions I believe as follows:

"1. Present mining laws, rules and regulations are sufficient but need better observance and enforcement.

"2. A cooperative effort by both employees and management on safety is needed.

"3. Face bosses must be educated along safety lines.

"4. The individual worker must be educated as to the dangers surrounding his particular job.

"5. It will take an honest effort on the part of employees and management to put a better program over."

Arch J. Alexander, Chief
Department of Mines, Charleston, W. Va.

"Needed—something different"

"I most certainly desire to see control and enforcement of safety left with state agencies, provided some way or means along the line of your program can be accomplished—something which the states are not doing too good a job of at present.

"My thoughts are that some plan be worked out by all the coal-producing states and the industry toward assisting one another in a safety code equal to or better

than any now in existence. I have in mind the Conference of State Governors and the Interstate Oil Compact Commission.

"Many coal operating companies have made great strides in safety . . . but too many go right on doing business as usual and their unfavorable accident rate, plus a major disaster every so often, is an indictment against the industry as a whole.

"Hence my thought is that the industry and every state should help all other states in mine safety and enforcement . . . From personal experience with mine legislation in this state, it's going to take something or some way different from the old order to accomplish the desired results.

"I am enclosing for your consideration a pamphlet, 'The Interstate Compact to Conserve Oil and Gas' . . .

"I realize that it's a long way from oil and gas conservation to mine safety. But I do know the Interstate Compact Commission has been very successful in its purpose—to build a bulwark against federal control.

"I sincerely believe such a set-up is worth consideration in line with Point No. 3 of your program—organizing for results."

John M. Malloy, Chief Mine Inspector
Oklahoma City, Okla.

A company safety director speaks his piece . . .

"A great deal at stake"

"Recent developments and the accumulating demand for additional mining legislation are the net result of a luke-warm attitude on the part of too many mine officials and miners' officials regarding the thing of first importance—humanity.

"The demand for and the securing of further legislation will do little, if anything, to better the present situation unless there is a conscientious application of any authority given in the interest of saving lives. What the mining industry needs is not more inspections. We need better inspections—recognizing hazards and emergencies and doing something about them.

"The basic requirement in any program must include acceptance of all responsibility by management for any hazardous condition which confronts them, and subsequent procedure to be followed immediately to remove same. More frequent inside visits by top mine management would certainly be helpful.

"One helpful and necessary procedure would be a contractual provision between operators and miners that would set up a representative committee of both sides in each district to deal with violations of safe practices by either side and to have authority to apply some form of discipline.

"It goes without saying that any industry will eventually lose much of self-determination unless it accepts responsibility manfully. As we look back through the years in our industry and recall many of the mining disasters in which we have taken part as a rescue worker, we conclude, 'so unnecessary . . . someone did not do his job . . . someone failed in his responsibility.'

"The day is long past when the public can accept

any excuse for negligence in mine disasters. The operator loses his prestige, it is uneconomical, and a blight descends on miners' families and mining communities that neither time nor sympathy can erase.

"In my judgment, the fundamental requirement that is missing in our industry is lack of proper respect for the judgment and recommendations of the industry's safety engineers and safety inspectors. You can't legislate safety. It results from learning and acquiring good work practices that are taught and then enforced religiously by supervisors who have accepted full responsibility for preventing accidents and saving men.

"Would mining boards with equal representation be the answer? Keep in mind the need for unanimity of purpose and decision and the need for a follow-up on their work. Regular discussions and meetings could then be held in the various districts as may be deemed necessary by this board.

"When any such meetings are held, the questions or matters scheduled for discussion and dissemination should be discussed by board members representing both sides. This last reference, in my opinion, is paramount in the interest of employer and employee as a selling medium. Both sides must be represented in matters of safety if the plan is to operate. Both operators and miners have a great deal at stake.

"There is a crying need for better understanding, as well as a need to develop a mutual interest, on the part of both the operator and the miner in all matters affecting the success of the coal business, in which both are vitally interested and by which both are affected."

James H. Forgie, Safety Engineer
Armco Steel Corp., Montcoal, W. Va.

New On-Track Shuttle Car Boosts Loading Time at the Face

New transfer cars, loading into smaller mine cars, provide big-car advantages at the face. Prefabricated track, bridge conveyors and flexible-shaft drills aid in increasing productivity at Portage No. 2.

FLEXIBLE-SHAFT drills, bridge conveyors and trackmounted shuttle cars, developed in that order and representing three applied ideas of A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., are materially increasing efficiency and productivity in mining the Upper Kittanning seam at the company's Portage No. 2 mine, Portage, Pa.

The trackmounted shuttle car is the latest in Mr. Crichton's campaign to realize more of the untapped production potential of conventional mining machines. The new car, a unit of 8-ton capacity, increases actual loading time by cutting car-changing time behind the loaders in track sections.

In other sections, Piggyback conveyor, manufactured by the Long

Super Mine Car Co., provide a continuous-loading medium, again with the object of better utilizing the productive time of the loading machine, the governing factor upon which all other elements of the mining cycle are based.

The Crichton flexible-shaft drill, now driven for the first time through a power takeoff on a Jeffrey 35 B cutting machine, speeds drilling for Airdox breaking, reduces drilling labor and increases safety at the face.

USING THE TRACK SHUTTLE CAR

In developing the idea for the track-shuttle or transfer car, Mr. Crichton had to consider the following problems:

1. Soft bottom and grades up to

8% at Portage No. 2 made trackless mining impossible.

2. The alternative of converting to large mine cars had to be ruled out because surface facilities and clearances and radii in older sections of the mine would not permit large cars without major changes and consequent high investment. Also, over-the-end loading would limit the length of the car to a point where little gain could be realized.

3. There is a binder from 10 to 12 in thick in the seam which averages 62 in in thickness. Conversion to continuous mining with some form of continuous transportation, Mr. Crichton points out, would mean redesigning the cleaning plant to handle the full seam since, under existing methods, the binder is cut out and loaded separately. Furthermore, any change in size constist would complicate sales activities for a time.

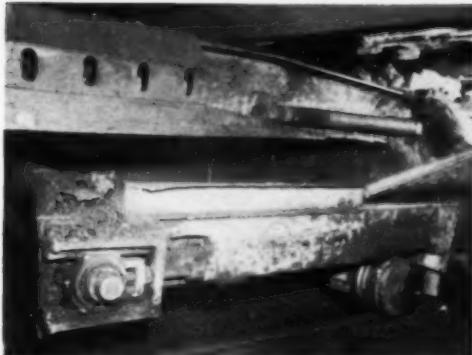
THE TRANSFER-CAR SOLUTION

Mr. Crichton's solution, which finally led to the construction of the

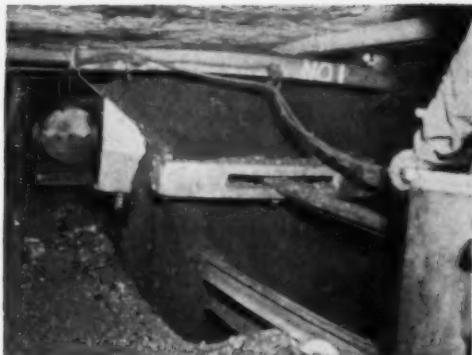


ON-THE-SURFACE VIEW shows new transfer car designed to reduce car change time where larger mine cars are barred by conditions. The motor and speed reducer at the side of the 32-ft-long car drive the loading and discharging conveyor.

Coal Age New Methods Report—1952 Series, No. 2



LOADING MACHINE is able to load from any angle because of the swept-back sideboards at the inby end.



TRANSFER-CAR CONVEYOR unloads 8 tons into a hopper between the rails which feeds car-loading conveyor.



LOCOMOTIVE OPERATOR controls the transfer-car conveyor by means of a push button in the power lead.



CHAIN CONVEYOR transports coal through a crosscut from the transfer-car hopper to the mine-car loading point.

new unit by the Irwin Foundry & Mine Car Co., was based upon the following points:

1. A larger, longer car could be used in new sections because clearances could be provided in the course of normal operations.

2. Heavy grades would not interfere if the new unit was hauled by a locomotive. The gathering locomotive would serve this purpose.

3. The length of the unit would not be critical if it was equipped with a conveyor similar to those in conventional shuttle cars. Then the load could be moved forward as the loading machine placed it in the car.

4. The conveyor also would be useful in discharging the load to smaller cars for the trip to the surface.

The finished car is 32 ft long, 6 ft wide at the top and 40 in high above the rail. The double-chain conveyor in the bottom of the car is 40 in wide. The unit rolls on two 4-wheel trucks, and in negotiating the turnouts, which are equipped with No.

2 frogs, about 34 in of side clearance from the rail is required.

A 5-hp Westinghouse motor and Falk speed reducer are mounted at the side of the car to drive the bottom conveyor, the motor receiving power from the locomotive controller through a cable. A pushbutton in the power cable is placed in the cab of the locomotive to permit the motor to start and stop the conveyor.

The hitch between the transfer car and the 8-ton trolley-and-cable-reel locomotive is a 5-ft-long steel tongue to compensate for the end swing of the car as it is hauled or pushed around curves. The sideboards at the inby end of the car are cut away to permit loading machine to load into the car from any loading angle, and the overhang of the car beyond the inby truck increases the effective reach of the loading machine.

A special truck was used to transport the cars into the mine, thus making it easier to maneuver them around sharp curves. Upon reaching the point of use they were placed on

the track and subsequent openings were designed for their use. In these openings and along the main haulage ways a slightly larger mine car could be used, so the company installed 5-ton Sanford-Day drop-bottom cars in place of the 2-ton wood cars formerly used.

HOW THE CARS ARE USED

The transfer of coal from the track-mounted shuttle car to mine cars makes use of a Jeffrey 61W chain conveyor installed in a crosscut between the discharge hopper for the transfer car and the loading point for the mine cars. The combined capacity of the conveyor and hopper is sufficient to handle the entire load of the transfer car, thus permitting the operator to unload without interruption.

Some dead work is required at the discharge point because the hopper must be sunk about 4 ft into the bottom, then graded up toward the loading point to permit the conveyor to be installed. However, the range

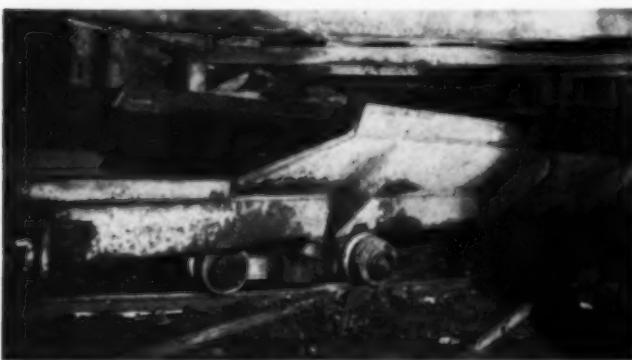
Transfer car increases loading time by reducing car-change time . . .



THE LOADING MACHINE actually loads for a greater portion of shift time since car-change time is reduced.



A BINDER, from 10 to 12 in thick, is cut out and loaded separately. Cuttings make up one transfer-car load per cut.



FOUR-WHEEL TRUCKS on transfer car easily negotiate No. 2 frogs. Maximum clearance required inside curves is about 34 in.

of the locomotive-drawn transfer car makes it unnecessary to move the loading and discharge points except at infrequent intervals. In one instance, panel coal was successfully hauled 650 ft, 1,300-ft round trip, with two cars without slowing down the mining cycle.

THE MINING SYSTEM

The transfer-car workings are opened by a 7-heading main entry, as shown in the diagram. The mains had been driven approximately $\frac{1}{2}$ mi with the transfer cars and production for the 12-man crew averaged about 250 tons per shift throughout this period. The mine works two shifts per day.

Two transfer cars, two loading machines (Joy 14BU and 8BU) and a Joy 7AU cutting machine are major units employed in entry development. The crew consists of two transfer-car operators, two loading-machine operators, two helpers, a cutting-machine operator, a scraper, a boom man and

three men on timbering and track-laying. The cutter and scraper also drill 3-in holes for Airdox coal-breaker. Eight holes, four top and four bottom, are required to break each 14-ft-wide cut where the kerf is made in the binder.

Transfer-car panels, like the one shown in the accompanying diagram, are worked by 6-man crews including a transfer-car operator, loading-machine operator and helper, cutting-machine operator, scraper and boom man. The crew averages about 150 tons per shift in panel workings.

In recovering a panel, the openings are driven to the projected limit, then pillars are taken immediately on retreat.

The mine-car loading point in development work is in the center heading, which is the main haulageway, and discharge stations for the transfer cars are in the adjacent headings. A typical transfer-car to mine-car setup for handling coal from a panel is shown on the map, and in both entry

work and panel recovery, these loading and discharge stations are moved forward with the work to keep haul-distance in balance with the cycle.

"PREFAB" TRACK IN USE

Bethlehem Steel Co. prefabricated track, made of 40-lb iron in 15-ft lengths and held on steel ties, controls the mining system by always keeping the cutting machine on sights. All switch parts are numbered. Consequently, after a short period of familiarization, the tracklayers become proficient in laying and recovering rails and tracklaying is quickly standardized. Also, prefabricated track permits making a good tracklayer out of any able-bodied man in a very short time.

In the panels, alternate crosscuts are driven on sights completely across the five panel headings, thus permitting a through track to be laid and releasing outby track for use in the advancing work.

BRIDGE CONVEYORS AT PORTAGE NO. 2

After about $\frac{1}{2}$ mi of driving the main entries with transfer cars, as mentioned, the seam began to thin out. The transfer cars were shifted to other sections and Piggyback conveyors were installed in the mains and in one panel section.

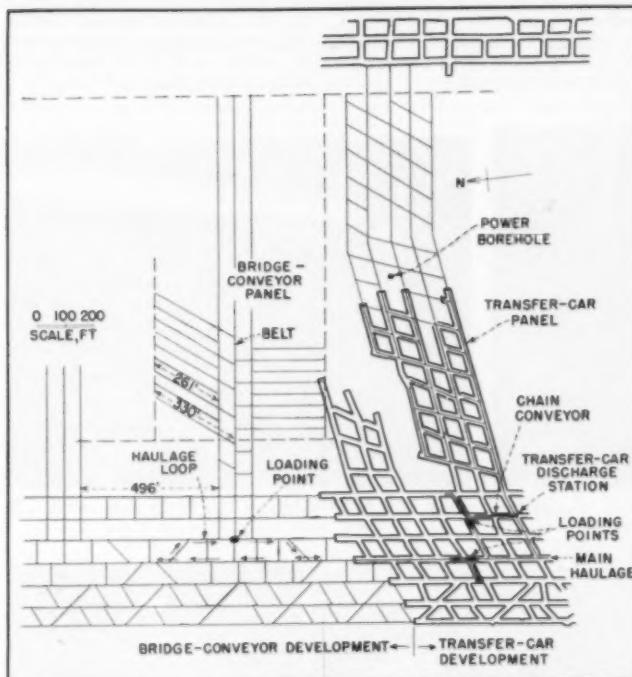
The main headings now are driven in pairs by two Piggyback conveyors and a Joy 12BU loading machine to a distance of about 600 ft before the equipment is retracted and the adjacent pair of headings is started. Two 300-ft-long chain conveyors, also furnished by Long Super Mine Car Co., are used in tandem in each heading to permit the 600-ft advance. Main-heading crosscuts are driven from both ends because of the 78-ft center distance between the headings.



SPECIALLY-DESIGNED YOKE at discharge end of bridge conveyor prevents spillage regardless of the loading angle.



LOADING-MACHINE OPERATOR gives all his attention to keeping his machine in coal as he loads in a crosscut.



TRANSFER CARS and bridge conveyors increase productivity in sections worked by conventional mining machines.

In the first room panel now being worked by Piggyback methods, productivity is up to about 30 tons per man-day for a crew of 10 face employees.

The room section is opened by a three-heading butt entry turned 90 deg from the mains. Under present plans, rooms are driven in sets of four at 60-deg angles from the butt entry to the left, advancing, and will be

driven 90 deg from the butt to the right retreating. The rooms to the left are worked down the dip and the 60-deg angle reduces the pitch for better room-conveyor performance.

The butt headings are 18-ft wide on 60-ft centers, while rooms are 20-ft wide on 46-ft centers. A 30-in belt in the center heading receives coal from the room conveyors and discharges to mine cars in the mains.

As shown in the diagram, alternate rooms are driven to the belt heading, with short cross conveyors carrying coal from the blind room to the adjacent room conveyor which discharges to the belt. This practice preserves the chain pillars between butt headings by reducing the number of crosscuts.

Equipment used in driving four rooms includes four Piggyback conveyors, four room conveyors, four cutting machines, four drills and two modified Joy 12BU loading machines.

The loading machines have been reduced to an over-all length of 14 ft by shortening the discharge booms to 8 ft. Furthermore, the swing jacks and the entire swing motion of the discharge boom have been eliminated, thus reducing loading-machine maintenance. Also, with Piggybacks, ramming of the loading machine by other units is eliminated.

As described in *Coal Age*, November, 1951, the drive end of the short self-contained Piggyback conveyor is attached to the end of the loading machine boom, then raised 2 or 3 in off the bottom by elevating the boom. The discharge end of the Piggyback is attached to a dolly which rolls atop the room conveyor.

Specially-designed pivots at both ends of the Piggyback provide center loading from loading machine to Piggyback and from Piggyback to room conveyor.

The combined length of the loading machine and Piggyback, 34 ft, is sufficient to permit room crosscuts to be driven completely through from one room to the next.

Each loading machine loads from two rooms, with tramway provided by installing room conveyors 5 ft outby the centerline of the outby room and 5 ft inby the centerline of the inby room. At present, ten 30-ton cuts per

shift are cleaned up in the four rooms, five cuts for each loading machine. Loading time per cut is about 30 min.

The crew in the room panel includes the following face men: two loading-machine operators, two helpers, two cutting-machine operators, two scrapers and two timbermen.

The standard timbering plan requires 14-ft-long crossbars on 5-ft centers, or closer when required, with a row of rib props 4 ft from the crossbar along the side of the room where the cutting machine is parked.

FLEXIBLE-SHAFT DRILL INCREASES EFFICIENCY

Last but not least, as a contributor to better mining at Portage No. 2, the improved Crichton flexible-shaft drill (*Coal Age*, July, 1949) has reduced drilling time to the point where a 7-ft-deep 3-in hole is drilled in about 20 sec. Five top holes and three bottom holes, drilled to accommodate an Airdox shell, are required

to break down a 20-ft-wide cut. Hardsocg throwaway bits are used.

The Crichton drills at Portage No. 2 are the first to be powered from Jeffrey 35 B cutting machines, as noted previously. The power take-off is installed at the front end of the cutting machine in contrast to previous applications where the power take-off is at the rear.

The 29-lb drill turns the auger at 900 rpm, and is equipped with a safety clutch for stopping the auger if for any reason the bit should stick, thus precluding any possibility of the drill head twisting in the hands of the driller. The manually-operated clutch permits the driller to "feel his way" through hard spots. Since there is no forced feed at such times, there is less wear and tear on bits and other drill parts. The two input shafts at the rear of the drill turn in opposite directions to permit the drill to turn clockwise regardless of the direction of rotation of the cutting machine or power take-off.

As at other Johnstown Coal & Coke mines, the Crichton drills at Portage No. 2 have increased safety for the driller, reduced maintenance because of the absence of electrical connections and components, and materially increased drilling speed.

THE SEARCH GOES ON

The search for more efficient methods by management of Johnstown Coal & Coke is a reflection of the progressive attitude of Andrew B. Crichton, president. Assisting Mr. Crichton Jr. in modernizing mining methods are John N. Crichton, general manager, and John J. Resick, general superintendent of the company's Pennsylvania mines. Mine supervision is the responsibility of Charles F. Richardson, mine superintendent, Portage Mines Nos. 2 and 4, and John Hopson, mine foreman, Portage No. 2. Stanley Smetana, section foreman, is in charge of the transfer-car section, and F. A. Mastelar is foreman in the Piggyback section.



POWER TAKE-OFF for flexible-shaft drill is mounted above cutting bar at front end of cutting machine.

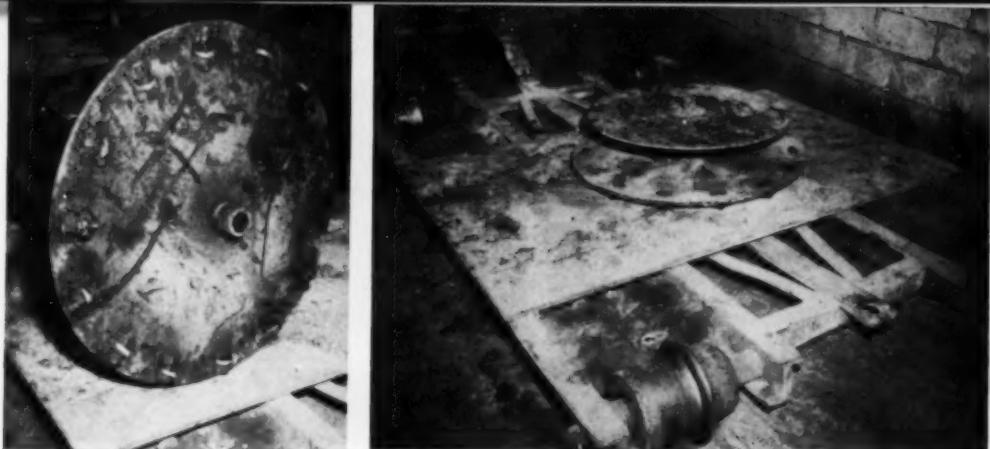


HOLE FOR AIR-BREAKING TUBE, 7 ft deep and 3 in in diameter, is drilled in about 20 sec.



PORTAGE NO. 2 SUPERVISORS—C. E. Richardson (left), mine superintendent; John Hopson, mine foreman, and Stanley Smetana and F. A. Mastelar, section foremen.





Lowboy Takes Grief Out of Cable Handling

IF YOU'VE EVER WRESTLED heavy cables off stationary reels by hand, with the usual difficulties in rolling the cable to prevent kinks, you'll appreciate the saving of time and hard work in stringing of new AC and DC cables made possible by the addition of this demountable turntable to a lowboy at No. 1 mine, Olga Coal Co., Coalwood, W. Va. The lowboy now serves two purposes: transporting heavy machinery, and as a cable car.

The lower section of the turntable is a $\frac{1}{2}$ -in steel plate 30 in in diameter, with 14 Size No. 205 ball bearings mounted on the bottom side near the periphery (left photo). Short axles through the bearings are held by U-straps welded to the plate. A steel tube 8 in long was centered in a hole drilled in the center of the plate and then welded into place. To accommodate the tube, a hole was made in the

center of the lowboy's flat steel deck and a larger receptacle tube 3 in long was welded to its underside. When placed on the lowboy, the reel-carrying plate is thus centered and ball-bearing supported. To handle smaller reels, a second plate with a smaller tube in its center is mounted above the larger turntable by slipping the lower part of the smaller tube into the upper tube of the large plate (right).

On the larger turntable, which can be used independently of the smaller, 1,000-ft lengths of 7,500-v No. 2/0 three-conductor cable weighing about 6,000 lb with the reel, have been handled with ease. The smaller plate is used for stringing 350-ft lengths of 500,000- and 1,000,000-cir mil single-conductor cable for 275-v DC distribution from rectifier substations. The 7,500-v cables conduct 4,000-v power from the bottoms of boreholes to the substations.

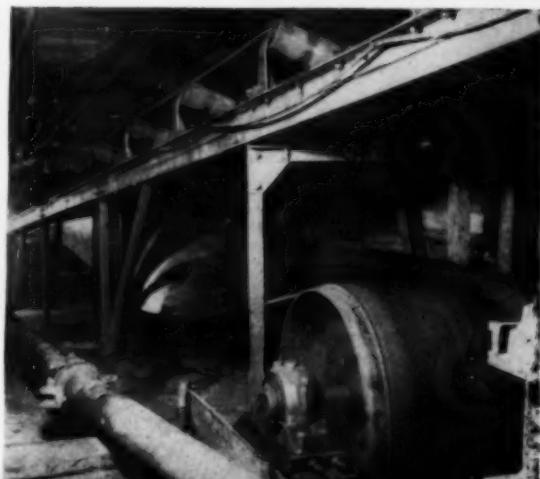
"Turnover" Belt Ups Conveyor Efficiency 20%

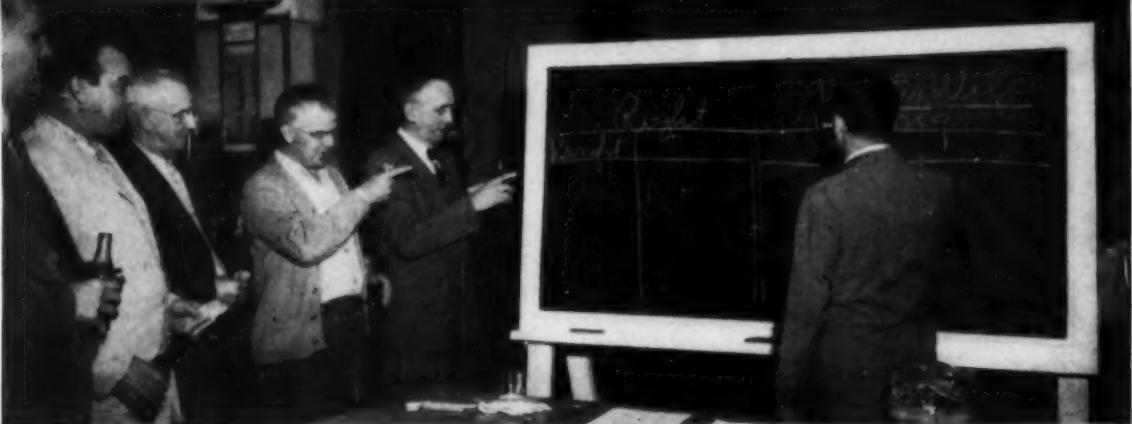
A NEW BELT-CONVEYOR SYSTEM, in which the belt turns itself over after delivering its load and then turns back 180 deg before taking on a new load so that the belt's clean side is always on the idlers, increases carrying capacity of mining conveyors as much as 20%, according to Eugene R. Traxler, chief development engineer in flat belting for the B. F. Goodrich Co. Developed jointly by Goodrich and the Chain Belt Co., the "turnover" belt is shown in operation at a Michigan iron mine where it is permitting hitherto impossible normal operation during sub-zero winter weather.

Conversion of any conventional belt system into the turnover type by positioning two twist pulleys at each end is a simple matter, reports indicate. The system is particularly applicable where loads have been restricted below actual capacity because of danger of spillage onto the lower return run. With the turnover belt, clean-up of spillage is greatly reduced and the need for deck plates for protection of the lower run is eliminated. Spillage onto the lower run falls on the belt's load-carrying side, is carried to the tail and automatically dumped for subsequent reclaiming. Sticky material cannot accumulate on rotating metal parts and wet mate-

rials can be handled at sub-zero temperatures without the belt freezing to pulleys and idlers.

More work-proved "Ideas" on p. 104.





INFORMAL DISCUSSIONS of problems and cementing friendships among men who may see each other infrequently are important phases of EG&FA "human relations" conferences. Here at Powelton Div. meeting, Walter Wilson, training superintendent, takes down answers of C. B. Canterbury (left), Curtis Foster, James Lindley, Clarence Kirby and Dewey Holmes.

Fact-packed training, informal approach, congenial discussions . . .



HOUSTON DIV. "COMMENCEMENT" in Bluefield, brings together Eddie Shaw (left), division superintendent; Don Shupe, Carswell superintendent; J. H. Muncy, outside foreman; H. A. Quenon, division manager; Eddie Taylor, Maitland superintendent; and C. A. Perdue, Keystone, superintendent. Program organizers (right) are W. G. Strathern, D. C. Stewart and W. A. Wilson.



SUPERVISORS FROM McDOWELL COUNTY (W. VA.) MINES meeting at the Carswell Community Hall is a session typical of those held at eight locations in Southern West Virginia, Pennsylvania and Northern West Virginia.



SMALL FINES discourage "private conferences." Here, Leroy Laxton pays 25¢ fine to Carlo DeFelice.

EG & FA Trains Supervisors: “Human Relations” for All

In a comprehensive program specially developed to meet mining conditions, EG&FA Coal Div. presents sound personnel-management principles to mine bosses supervising its 10,000 employees. Practical human approach for greater worker satisfaction and better mine operations keynote 8-wk course holding interest of both top officials and shift foremen.

"People must be treated as individuals because each one is an individual."

"Make the best possible use of each person's ability."

"Let each worker know how he is getting along."

THESE AND MANY OTHER tried principles of sound modern personnel management are being heard frequently these days throughout the supervisory organization of Eastern Gas & Fuel Associates' bituminous coal mining operations in West Virginia, Pennsylvania and Kentucky. One of the nation's largest soft coal producers, Eastern is pioneering a training program in "human relations" for its coal mine bosses—from superintendents right on to foremen.

The program is still in its infancy,

but already it has been recognized as the most ambitious effort of its kind as yet attempted in the coal mining industry. By Dec. 1, 1951, more than 240 of the top people in charge of nearly 10,000 mine employees were to have attended a series of eight weekly shirt-sleeve conferences at which the methods of applying "human relations" on the job were thrashed out in give-and-take discussions. By that time, too, the first group of shift foremen were to have completed the series of conferences, and Eastern will complete the program throughout its mines as quickly as training manpower permits.

BACKED BY TOP MANAGEMENT

Prime mover behind this big effort to help supervisors develop their skills in handling people is L. C.

Campbell, vice president in charge of Eastern's mining operations. Mr. Campbell, with a strong background himself in actual field operations, has long felt there was no reason why the training programs so effective in other industries could not be adapted to coal mining. Beyond the obvious value of good "human relations" for its own sake, he was convinced that it would be good business, too. The better a worker liked his job, the better job he'd do. Allowing for a few firmly entrenched customs of the coal fields, Mr. Campbell believed that mine supervisors would respond as eagerly to the chance of improving their supervisory abilities as the management staff in any industry.

NEEDS STUDIED FIRST

Plans for a training program of some kind in Eastern's mining oper-



"GRADUATION EXERCISES" on the final night are held during a dinner meeting, with pleasure combined with a review of the "human relations" principles worked out in the weekly conferences. This Powellton Div. Group is shown in the Reese Hotel, Charlton Heights, W. Va.



TOP MANAGEMENT BACKING: L. C. Campbell (right), vice president, presents graduation "Certificate" to T. H. Bailey, mine foreman.

ations began to take shape with the establishment of an industrial relations department in the Coal Div. D. C. Stewart, long a member of the Pittsburgh staff of the division, was appointed industrial relations manager in 1950. Soon afterward Walter A. Wilson was appointed training director.

Mr. Wilson brought to the training job an unusual combination of talents. A university graduate and a former school teacher, he went into coal mining and worked up through a succession of supervisory positions until he became one of the company's top operating men in the field. At the time of his appointment as training director he was superintendent of the Coal Div.'s Beards Fork mine in Fayette County, West Virginia.

Mr. Wilson set out first to get the answers to two questions:

1. Did the operating men in the field really want supervisory training?

2. What kind of training did they want?

The answers were convincingly clear. Out of a personal visit to each of the 20-odd mines, he brought an enthusiastic majority request for training in "human relations."

Eastern Gas & Fuel Associates had such a training program to offer when its Coal Div. called for it. For several years, the training staff in Boston, under Wallace G. Strathern, EG&FA training director, had been conducting or assisting with supervisory-training programs in its Boston and Pittsburgh offices and at its coke plants in Everett, New Haven and Philadelphia. The training had taken various forms, according to the local need. In some cases, it emphasized job instruction—the way to teach a specific operation to a worker. Elsewhere, the emphasis was on sales techniques or office management. In all cases, "human relations" was a basic part of the program.

Stewart and Wilson sat down with Eastern's training staff and together they worked out a program which would be practical for the mines. The first effort, it was decided, would have to be directed to the upper level of mine management, with the broader job of training shift foremen to follow as soon afterward as possible.

KEY SUPERVISORS START BALL

The first meetings were held last spring at five locations throughout West Virginia on different nights of the week. Skilled conference leaders from Eastern's training staff traveled from meeting to meeting to take charge. About 160 top supervisors

from the Southern West Virginia mines attended. Those taking part included general superintendents in charge of a group of mines, mine superintendents, general mine foremen, assistant general mine foremen, mine accountants, safety inspectors, plant engineers and transitmen. One evening a week for eight successive weeks, these men discussed the duties and responsibilities of a supervisor, job relations, how to induce a new worker, how to give orders, how to reprimand, how to handle grievances, "how to be human on the job." Although some of the groups were larger than the ideal for round-table meetings, the emphasis was on "audience participation."

In the virtually unexplored field of human-relations training for mine bosses, Eastern's trainers knew they could learn as much, if not more, than they could teach. Comments and reactions by conference members were eagerly noted for planning subsequent programs.

This "test run" for top supervisors was an unqualified success. Mr. Wilson, with the assistance of the Boston training staff, immediately set up a similar series for this past fall for supervisors of Eastern's Pennsylvania and Northern West Virginia mines so that all top field operating men would have the training. What is more, they scheduled the first meetings for shift foremen at Eastern's large Keystone mine, in the Pocahontas field, McDowell County, West Virginia. The meetings for shift foremen, like those for top supervisors, are held on the men's own time. Although attendance is voluntary, the interesting nature of the program and the obvious value to the men themselves in offering solutions to their common problems of handling crews have kept attendance at the sessions nearly 100%.

MORE INSTRUCTORS TRAINED

The interval between the end of the first series in the spring and the beginning of the second in the fall gave the Coal Div. a chance to "train some trainers." C. Robert Angove, Keystone mine, and B. F. Powell, Federal No. 1 mine, Grant Town, W. Va., attended an instructor-training session in Boston to prepare them to extend the program to shift foremen. They will assist Mr. Wilson in taking the program to shift foremen throughout all of Eastern's mines.

The pattern of the mine-training program has now been established. Atmosphere of the meetings is kept as informal as possible. Home-made "place cards" identify conference members by name and nickname. Doughnuts, "coke" and coffee are

passed around at recesses, when the men can mingle and talk over subjects covered during the meeting. Members who arrive late or hold "private conferences" of their own are assessed small fines.

One of the hardest problems to lick in planning training for a group of bituminous coal mines is geography. Mines are often isolated from one another, with the roads between winding and hilly. Eastern feels its program is worth the effort of overcoming this handicap, and conference leaders may travel as much as 150 mi a day by car from meeting place to meeting place. They "hit the road" in this way for 8 wk.

Visual aids are used extensively in the program. The training staff has a traveling visual aid kit that serves to emphasize important points with chart presentations and blackboard "chalk talks."

One of the novel features is the "graduation exercise" held at the end of each series. When his schedule permits, Mr. Campbell himself presents the certificates to the "graduates," and, in his absence, the division manager makes the awards at the final dinner meeting.

FOUR-STEP METHOD USED TO SOLVE HUMAN PROBLEMS

The "human relations" principles which the supervisors are taking back to their jobs at the mine are no different from those that have been applied effectively in other industries. They learn a proven four-step method for solving problems that arise in handling employees. "Get the facts," they agree, is the first "must." With the facts in hand, the supervisor then should "weigh and decide." Having reached a decision, he "takes action" and, finally, he "checks results." Mine supervisors are being advised to be good listeners, to "agree before you disagree," to "wear a friendly smile," to "be generous with honest praise," to "talk in terms of 'you' not 'I,'" and "don't argue; when you win, you lose."

To the public which knows about coal mining only from newspaper headlines, this may seem like strange advice for mine supervisors. Those familiar with the industry, however, know that it is progressive and will not be surprised. But, even those who know the industry well will recognize this extensive training program undertaken by Eastern Gas & Fuel Associates as a pioneer effort to apply more generally in mining the tried-and-true human-relations knowledge—knowledge which, when used, goes so far in increasing employee satisfaction on the job.



MECHANICAL MARVELS are practical for underground use today because their designers equipped them with hydraulic "muscles" for faster, more flexible operation.

Hydraulic Systems -- Operation and Maintenance

**WHY Modern High-Speed Mining Depends Upon
Hydraulic Systems for Efficient Power Transmission**

**HOW to Get Top Performance Out of Both Fluids
and Systems Under Coal-Mine Conditions**

Archimedes Would Have Used It Too!

IN THE 298 YR since Blaise Pascal gave expression to the fundamental law of hydraulics, the science has advanced to the place where fluids under pressure perform more and more of the world's work while requiring less and less assistance from men's muscles. Pascal's simple observation—pressure exerted on a fluid reacts with equal force on all equal areas in all directions throughout the fluid—triggered the trend toward wider application of fluids as power-transmission media in machines.

In pointing out the virtues of simple machines long before Pascal's day, Archimedes of Syracuse said, "Give me a lever long enough, a fulcrum strong enough and a platform in

outer space upon which to stand and I could raise the Earth!"—or words to that effect. If Archimedes lived today he probably would revise his statement thusly: "I'll take me a great hydraulic jack, use a much smaller lever and be able to get a lot closer to the job."

There's the point! Some of our modern mining machines would be encumbered to the point of uselessness if all machine functions had to be powered through mechanical linkage. Imagine the weight, bulk and absurdly intricate controls that would have to be added to a continuous-mining machine to mechanically actuate all its motion. In short, it would not be practical.

HYDRAULICS is an integral part of your continuous-mining machine, mechanical loader, cutter or drill. It transmits power more economically, requires less space and provides more accurate high-speed control than any other method now known.

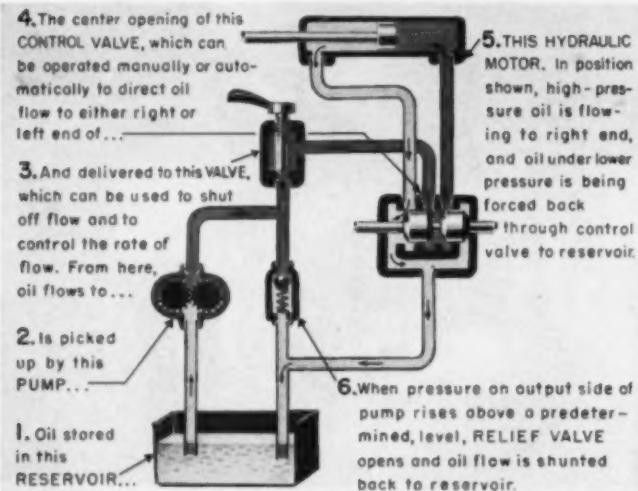
But to do its job, a hydraulic system, like other parts of specialized high-speed mining machinery, puts a premium on proper operation, effective maintenance and careful selection of its elements. The rules are simple—but important! First though, what is a hydraulic system?

HOW A SYSTEM WORKS

A simple system has five parts, as follows:

1. A pump which converts the energy of its driving unit into high fluid pressure.
2. Transmission lines to carry the pressurized fluid through the system to point of use.
3. A working unit (cylinder-and-piston or fluid motor) to convert the energy in the high-pressure fluid to useful effort.
4. Return lines to carry the limp fluid back to the pump for another energy injection.
5. Last but not least, the fluid itself.

Top performance demands cleanliness, proper design, intelligent care . . .



Sun Oil Co.

WHAT MAKES UP A HYDRAULIC SYSTEM

ALL HYDRAULIC SYSTEMS have these elements, though their actual design features may vary widely. Refinements and variations depend on applications.

Refinements such as additional working units, flow-control valves and external devices, which make the system perform at the operator's bidding, are added to this elementary set-up to permit the application of hydraulic power to industrial demands.

For example, a reservoir is provided to insure an ample supply of fluid on the suction side of the pump, and the return line from the working unit discharges energy-spent fluid to this reservoir. Check valves in the lines prevent the fluid from traveling out of its appointed path. Selector valves, which are controlled manually, hydraulically, electrically, mechanically or pneumatically from the operator's station, determine the paths the fluid will take. Relief and unloading valves protect the system against excessive pressure by returning fluid from high-pressure lines to the reservoir.

Accumulators may be provided to smooth out fluctuations in pressure, thereby absorbing line shocks, or to furnish intermittent high-power surges beyond the capacity of the pump. They serve the hydraulic pump in much the same manner that a storage battery serves an automobile generator.

Each of the units may vary widely in design according to the application to be served, but its function remains the same and its malfunction probably results from an ailment that is common to its class. To some extent,

therefore, it is possible to systematize preventive maintenance and troubleshooting for hydraulic systems.

II FOR HYDRAULIC ELEMENTS

The most important single factor contributing to trouble-free operation is cleanliness. Foreign matter in the system or in the fluid is certain to cause trouble, and, for obvious reasons, anti-contamination precautions must be more diligently applied in mining than in any other industry.

Other preventive-maintenance and safety tips for hydraulic-system elements are briefly summarized in the following material.

Pumps—Before starting a new or repaired pump, turn it by hand to be sure it turns freely, then watch it as it starts to be certain it turns in the right direction. Be sure the reservoir is full. Set the machine controls at neutral before starting. Tighten mounting bolts and pipe fittings to the pump periodically.

Cylinders—Because of the simplicity of their design preventive-maintenance suggestions applying to cylinders generally are limited to checking for external leakage that results from worn gaskets or packing, checking for internal leakage caused by worn piston rings or scored cylinder walls (usually characterized by sluggish action and low efficiency), tightening mounting bolts and testing alignment periodically, and being careful in the use of tools so that tool marks will not raise burrs to destroy packing.

Fluid Motors—Essentially, fluid motors are the same as hydraulic pumps and require similar preventive maintenance.

Valves—Check pressure settings on relief and unloading valves. Be certain that valves are correctly assembled after cleaning or repairing. Disconnect power from electric-hydraulic valves before working on them. Be careful in disassembling spring-loaded valves because of the hazard of flying parts. Check alignment after re-mounting valves.

Reservoirs—Maintain the recommended fluid level. Keep the air filter clean or, in the absence of an air cleaner, keep the breathing hole open and clean. Clean the outside of the reservoir thoroughly before changing or adding fluid. Clean the inside of the reservoir when oil is changed.

Accumulators—All accumulators are pressure vessels, regardless of whether they are gravity-, spring-, diaphragm- or bladder-actuated. A major safety precaution, therefore, is to be certain that their internal pressure is dissipated before disassembly is attempted. Preventive maintenance consists of periodically checking for leaks which may result in sluggish action or no action at all.

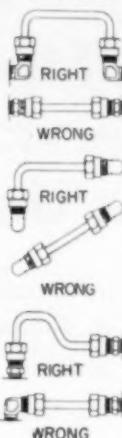
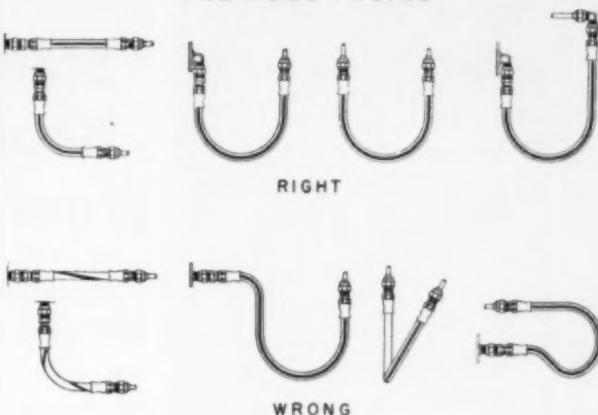
Rigid Tubing—Again, cleanliness is paramount. Proper assembly is next in importance.

Galvanized tubing is never used in hydraulic systems because flakes of zinc may be carried by the fluid into the pumps or valves, and this emphasis on cleanliness sets the tone for handling tubing made of other materials. Clearances in hydraulic equipment are too close to tolerate any foreign matter, no matter how small the particle-size. Extreme care is necessary, therefore, to keep such material out of the system when the mechanic replaces tubing.

Approved practice consists of making up replacement sections in the shop where better conditions for such exacting work prevail. Cleaner lines, better bends and tighter joints will result.

Replacement sections should be duplicates of the sections to be replaced because every bend and fitting has been included for a specific purpose by the designer. Expansion and contractions with changes in temperature, elimination of vibration-caused stresses and the symmetry of the system are some of the factors the designer considered.

Flexible Tubing—Where hydraulically-powered machine parts are required to move in relation to each other, flexible hoses are indispensable. The mention of flexible hoses raises

RIGID TUBING**FLEXIBLE TUBING**

The Weatherhead Co.

**HOW TO PROPERLY
INSTALL TUBING**

RIGID TUBING SYSTEMS (left) should be designed symmetrically, avoiding straightline connections on short runs and supporting long runs with brackets or clips. Flexible tubing (right) should not be sharply bent or twisted. Allow for about 5% shortening under pressure.

a spectre that haunts the art of continuous mining, so it is well worth the time of all interested parties to cast about for a possible solution to the problem of hose ruptures.

It appears that the hydraulic shock which breaks hoses closely resembles the phenomenon known as "water hammer" in plumbing systems. Consider the energy in a stream of water moving through a pipe at high speed. If a valve in the line is suddenly closed, this energy must be dissipated in a pressure wave that surges back and forth at high velocity in the pipe. The pressure wave alternately expands and contracts the pipe walls and, like sledge-hammer blows, the impact produces "clanking" noises. If the pressure is too high the pipe or valve ruptures. One common remedy for water hammer is the installation of slower acting valves in the plumbing lines.

So in hydraulic systems it may be "fluid hammer" that contributes to flexible-hose breakage, and the machine operator may be able to reduce the frequency of hose ruptures by using his control lever as a feeder, not as a ram.

A worthy investigation might consist of tabulating the number of breakages suffered by each operator, and the remedy then becomes a matter of training deficient operators to achieve the standards set by more proficient operators.

To help eliminate excessive writhing and high stresses in hoses under pres-

sure, the hoses should (a) be bent in only one plane, (b) have a bend radius equal to at least 5 times the O.D. of the hose and (c) be installed free of longitudinal twists.

HOW TO SELECT AND MAINTAIN HYDRAULIC FLUIDS

The preferred hydraulic fluid for modern applications is petroleum-type oil. That raises the question: Why oil? Why not water? The answer is contained in the primary functions that must be performed by the fluid in industrial applications. They are (1) the efficient transmission of power, (2) the protection of hydraulic elements from corrosion and rusting and (3) the effective lubrication of the units in the system. Water or other fluids will not satisfy the last two requirements.

For low-temperature, low-pressure applications, a straight mineral oil may be suitable, but for typical mining applications, hydraulic oils usually are fortified with chemicals known as additives. The additives are placed in the oil to increase the life of the oil and the system by preventing oxidation of the oil and rusting and corrosion of the system, and also to suppress foaming tendencies.

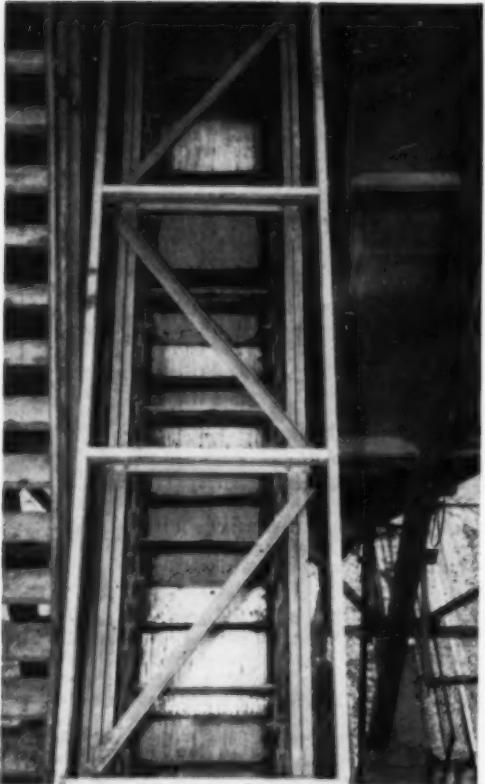
However, additives do not relieve the machine owner of all his troubles. The additives, though they do an excellent job, also require some maintenance. Absorbent-type filters will not strain additives out of the oil but adsorbent-type filters may do just that.

If a different oil is used as make-up, it should be definitely established that the additives of the original and make-up oils are compatible. If straight mineral oil is added to a system using fortified oil, the make-up oil may redissolve some of the protection that has plated-out onto metal surfaces from the fortified oil. Be wary of mixing hydraulic oils!

If cogent advice concerning the selection of hydraulic oil can be compressed into a single sentence, here it is: Don't go overboard on "specification buying." The oil companies themselves recommend that specifications be balanced with performance data that shows how specific oils satisfy your conditions.

The oil you select is far-and-away one of the most important parts of your hydraulic equipment; therefore it merits loving care. Drums of oil, as received, should be stored under cover to keep dry. While modern hydraulic oils have excellent characteristics for limiting the bad effects of entrained water, there's a limit.

Keep the oil and the system clean. Test the oil periodically to be certain that it has not oxidized to the danger point. Drain used oil on schedule. Finally, train hydraulic-system mechanics to keep systems and oils as close as possible to their original conditions. It's a foregone conclusion that you have "a man who comes around." We mean your oil salesman. He wants his oil to do a good job for you, so pick his brains.



BRIGHT SECTIONS ARE VISIBLE PROOF of stainless-steel effectiveness. The three stainless wedge-slot dewatering screens in this scraper conveyor elevating at 45 deg stayed bright and clean while the abrasion-resisting steel plates between have rusted to a yellowish brown after only 12 hr of non-use.

Stainless Steel Boosts Service From Plant Units

Sunnyhill gets better preparation with fewer production delays and real cost savings by using stainless plates, screens and fittings. Screen blinding, choked chutes, corroding of pipe threads and adjusting screws solved.

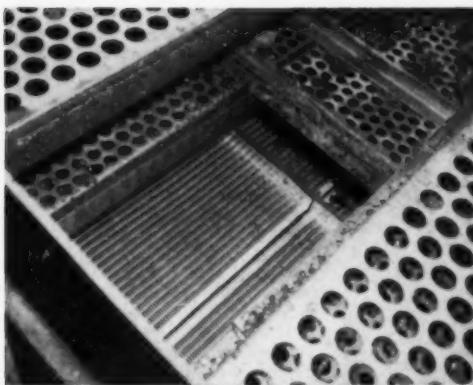
BETTER PERFORMANCE from coal-preparation equipment, large savings in maintenance labor and fewer production delays are the principal dividends from the diversified uses of stainless steel in the preparation plant at the No. 8 mine, Sunnyhill Coal Co., New Lexington, Ohio.

Screens that were very inefficient because of blinding, and lasted only about a year, now stay clear and last over 2 yr. Chutes that blocked from rusting of bottoms after shutdowns now let the coal slide freely right from the start, while some water connections that used to fail in three days to a week now last years. Each new stainless screen installed on a dewatering shaker is credited with saving \$1,000 in maintenance labor because of fewer renewals, as compared to the use of carbon-steel screens.

Sunnyhill No. 8 mine is a strip operation shipping 7,500 tons of prepared "Sunnyhill Coal" per two-shift day. It was in a highwall of this mine that the Colmol was unveiled to the public. C. H. Snyder, who has spoken on

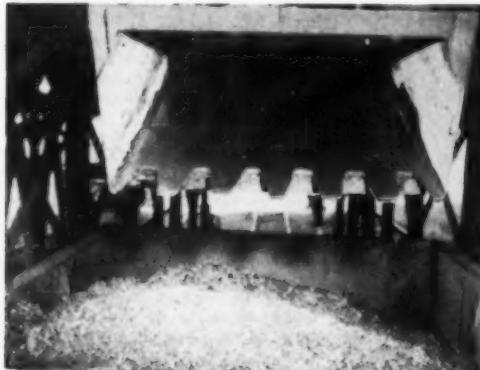


IN SUNNYHILL NO. 8 PLANT, shipping 7,500 tons of prepared "Sunnyhill Coal" per two-shift day, diversified use of stainless steel has paid appreciable dividends.



BETTER DEWATERING AND SIZING, a \$1,000 saving in maintenance labor for screen renewal and a five-fold increase in service life resulted from use of stainless steel on the bottom deck of this shaker (plates removed to show good condition of screen). All screen sections are stainless on this 6x16-ft vibrator handling $\frac{1}{4}$ x6-in washed coal (right).

▲ Shakers and vibrators handle more tonnage, perform better ▼



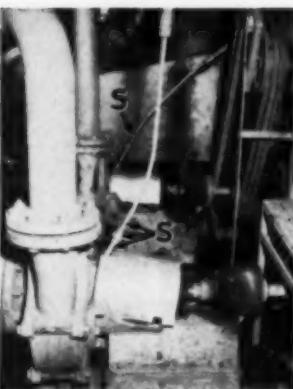
COAL NOW SLIDES FREELY in this car-loading chute with a stainless-steel bottom where formerly rusting choked flow. Much longer life and elimination of build-up were gained with stainless-steel flume (S, right photo).

▲ Choking and blocking of chutes and flumes no longer are problems ▼

continuous mining at many coal meetings, is president of Sunnyhill, which has main offices in Pittsburgh, Pa. Arnold E. Lamm is executive vice president in charge of operations. The mine office is the headquarters of P. L. Snyder, general manager of the Ohio strip operations. John Plump is mine superintendent; John Schwartz, preparation-plant superintendent; and

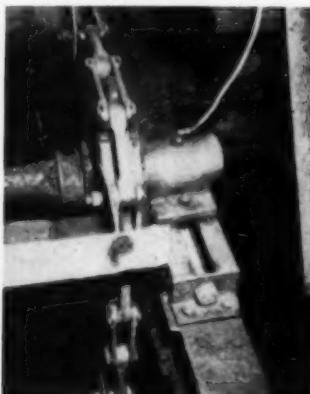


ON FLOP-GATE CHUTE handling principally oversize egg or lump (right), stainless plate (S) eliminated blocking. Before installation of stainless on 45-deg chute from centrifuge to mixing conveyor (far right), ordinary steel rusted and caused blocking after a few hours' shutdown.



ORDINARY STEEL NIPPLE corroded through at the threads, often after only three days' service, is held by Ralph Janeshek, maintenance superintendent. Connection to a recirculating pump in front of his right arm is stainless steel. Nipples, fittings and pipes connecting hoses to water seals of two 4-in sludge pumps (8, right photo) are typical of the stainless units in service 20 mo.

↑ Life of pipe parts increased to over 20 mo



WET FINE COAL (cleaned for photo), accumulating on the take-up screws of the mixing conveyor (S), corroding and freezing ordinary steel screws, is licked with stainless screws. On settling tank conveyor (right), stainless adjusting screw was still bright when muck was cleaned off.

↑ Take-up screws corrode and freeze no more

Ralph Janeshek, maintenance superintendent.

The preparation plant, completed in 1948, has a 400-tph 5-cell McNally Norton jig and a Reineveld centrifugal drier. In addition to the four tracks for loading railroad cars, the plant features four steel bins for loading domestic sizes to trucks and two bins for pea and slack sizes.

ACID WATER MAKES PROBLEMS

Water supply for the plant comes from surface drainage and is conserved for re-use. After a year or so of operation and ensuing dry weather,

acidity in the settling pond increased to pH 2.5 and troubles from corroded and blinding screens, "sticky" chutes and general corrosion were a great handicap to efficient and economical operation of the plant. Installation of stainless steel brought relief wherever applied. As a second line of defense—protection for all the plain steels used in the plant—liming of the water by hand proportioning to reduce acidity was started 10 mo ago. That reduced acidity to 4.5 to 5.5. To insure uniformity of treatment and reduce cost, installation of an automatic feeder for the lime is planned in the near future.

Stainless steels have proved so advantageous that their use will be continued and probably expanded in spite of the accomplished reduction in acidity of the water.

TONNAGE BOOSTED FIVE-FOLD

The first and most outstanding application of stainless steel was on the lower deck of the dewatering and sizing shaker receiving 5 x 0 from the jig. The original carbon-steel screen, 14-gage, with $\frac{1}{8}$ -in round holes, was used for a year, but with highly unsatisfactory results. The rough corroded surface slowed the coal, caused it to build up on the deck and was a reason for severe blinding. It accomplished very little dewatering or sizing.

This deck was renewed with a United States Steel stainless-steel screen made by the Hendrick Mfg. Co., which gave satisfactory service for 2½ yr and handled nearly five times the tonnage of the carbon-steel screen. Coal company officials estimate that at least \$1,000 in maintenance labor was saved by the fewer screen renewals. This stainless screen is 12-gage with $\frac{1}{8}$ x $\frac{1}{16}$ x $\frac{1}{8}$ -in short slots, which are equivalent to $\frac{1}{4}$ -in round holes.

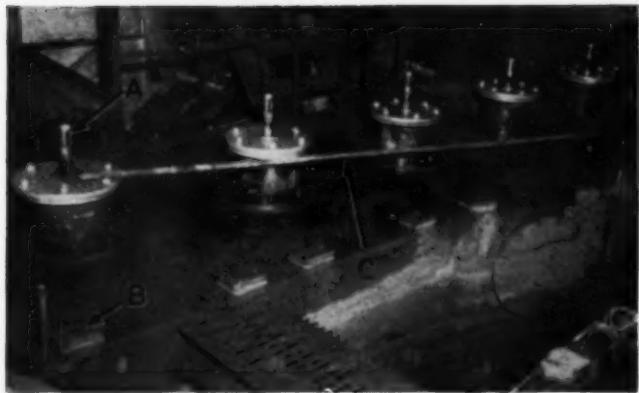
IMPROVE SCRAPER CONVEYORS

The next installation of stainless steel was Hendrick wedge-slot screens in the bottoms of dewatering scraper conveyors. The 54-in conveyor pulling fines out of the settling tank uses a 54 x 72-in screen. The slots of this screen now stay open, while the abrasive-resistant screen used formerly would corrode and blind within a couple of weeks after installation.

Another job consisted of four 2 x 2-ft sections of stainless $\frac{3}{4}$ -mm wedge-slot dewatering screen installed in a 24-in scraper conveyor elevating $\frac{1}{4}$ x 0 from a slack boot to a truck-loading bin at 45 deg. After a shutdown of only 12 hr, there is a marked contrast between the bright stainless screens and the yellowish-brown rusted abrasive-resistant plates between them.

CHUTE BLOCKING ELIMINATED

Chute bottoms which rusted after shutdowns of a day or two caused much trouble when the plant was restarted. Men had to help the coal along until the rust was scoured off. Because of space limitations, a railroad-car loading chute handling 2-in nut and smaller does not have the pitch usually provided for that service, with the result that with abrasive-resisting steel there was considerable choking of the flow. With the bottom changed to stainless, coal slides freely.



ON THE JIG WASHER, stainless fixed problems on five connecting rods (A), spare connecting rod (C) and cap-covered baffle-gate adjusting screws (B).

↑ Stainless steel solves jig-maintenance troubles

A flop-gate chute from the No. 1 loading boom to a 2-compartment mixing conveyor handling principally oversize egg or lump blocked at times because of a build-up of stuck material. Again, the remedy was replacing the ordinary steel with stainless.

Another problem was a 45-deg chute handling $\frac{1}{4}$ -in x 20-mesh from a Reineveld centrifuge to the mixing conveyor. Containing 10 to 12% moisture, this product would not slide on ordinary steel after the rusting that occurred during a brief shutdown. After replacement of the 30-in x 12-ft bottom with $\frac{3}{16}$ -in stainless steel there was no further difficulty. A much longer life than abrasive-resisting steel, plus the elimination of buildup, were the reasons for putting $\frac{3}{16}$ -in stainless in the two flumes from the washer-feed conveyor to the jig. Now eight chutes in the plant are operating with stainless-steel bottoms.

Success with the first two stainless-steel screens led to stainless on several other screening jobs in the plant, so that the total now stands at 11. An interesting application is the 32 x 48-in $\frac{3}{16}$ -in wedge-slot dewatering screen in the flume from the jig to the dewatering screen. This accomplishes considerable dewatering, stays free and shows indications of long life.

Stainless-steel wedge-slot has been put on both decks of an Allis-Chalmers 6 x 16-ft Low-Head vibrator handling $\frac{3}{4}$ x 0 washed coal. The top deck is 8 mesh and the lower deck, 28 mesh.

For the plates in chutes and flumes and the perforated screens, either Type 302 stainless (18% chrome, 8% nickel) or Type 410 stainless (12% chrome) is used.

PIPING TROUBLES FIXED

Stainless steel eliminated some particularly annoying troubles with the pipes conducting water to seals of recirculating pumps and sludge pumps.



How the Top 15 Coal Groups Rank

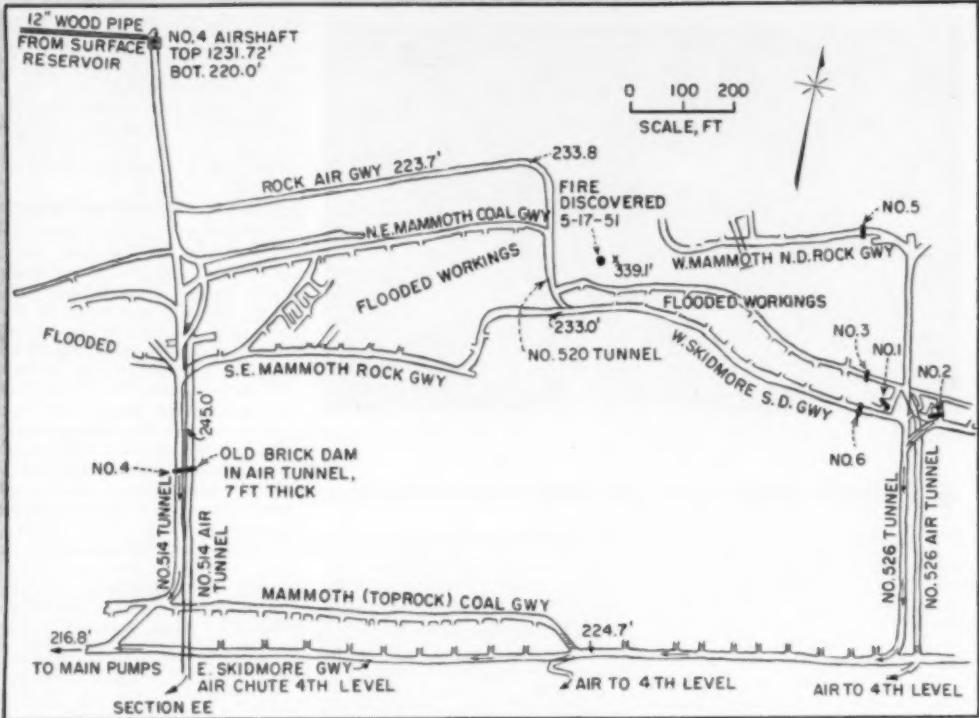
THE LEADERS ARE ON THE MOVE, through modernization of existing mines, new properties and acquisition of other firms, reports J. R. Forsythe, general manager, *Keystone Coal Buyers' Manual*, a *Coal Age* affiliate, in this study of the top 1951 producers.

The figures highlight some interesting changes. The top 10 bituminous producers, for example, in 1951 produced 23.5% of the 539.5 million ton national produc-

tion (*Keystone* total), compared with 21.7% in 1950. Ten of the leading 15 organizations (starred below) increased their output beyond the national average of increase. Pittsburgh Consolidation, the largest commercial organization, increased its share of the national output from 4.9% in 1950 to 5.2% in 1951. For the first time in some years, the top 10 does not include a producer of anthracite.

Group or Company	1951 Tonnage	% Change					Standing 1950 1951 1950 1949 1941
		From 1950	To 1951	Per cent	Rank		
Pittsburgh Consol.	28,169,957	+12.8	1	1	1	5 ^a 6 ^b 1	
U. S. Steel*	24,460,019	+ 9.9	2	2	2	1	
Eastern Gas & Fuel*	12,179,977	+17.7	3	4	4	3	
Peabody	12,028,149	- 0.9	4	3	3	2	
Island Creek*	11,168,737	+29.5	5	5	6	4	
Sinclair Coal-							
Southern Coal Group	9,368,467 ^c	- 1.3 ^d	6	13	8	36	
Bethlehem Steel*	8,800,301	+14.3	7	6	5	7	
Truxx-Traer	8,613,220 ^d	- 2.0 ^e	8	8	10	17	
Pittston Group*	7,329,237	+14.9	9	9	9	4	
Berwind-White*	6,317,630	+17.2	10	12	13	10	
Old Ben	5,971,452	+ 1.2	11	10	12	14	
Republic Steel*	5,894,850	+ 6.2	12	11	16	18	
Pocahontas Fuel*	5,869,391	+23.8	13	16	17	9	
Rochester & Pittsburgh*	5,762,517	+10.0	14	14	15	11	
Glen Alden	5,646,573	-16.4	15	7	7	8	

*Companies whose 1951 increase was above national average. ^aPittsburgh Coal and Consolidation Coal Co., before merger. ^bIncludes Northern Illinois Group, acquired 1951. ^cIncludes Binkley Group, acquired 1951. ^dGroup not then formed.



FIFTH-LEVEL PLAN shows location of dams which confined water from No. 4 shaft in fire area and controlled run-off to East Skidmore gangway during recovery.

Fighting Fire With Flood

Lehigh Navigation Coal Co., confronted by a fire in the Mammoth vein, chose "old reliable" flooding as the best method of attack. LNC's experience in building dams, circulating the water and recovering the section offers valuable lessons in how good planning and strict control can minimize the ravages of fire.

OFFICIALS OF LEHIGH NAVIGATION CO. aver it's a hair-raising experience to peer into a drill hole and discover what appears to be the inside of a furnace. That is what happened in this anthracite producer's Mine No. 4 at Lansford, Pa., May 17, 1951, when an official looked into a hole between two chutes in a Mammoth vein anticline section and found a brisk fire in the other chute.

The discovery of the fire was particularly heartbreaking because Mine No. 4 had been dewatered as recently

as 1946 after 18 yr of inundation. In 1928, abnormal rains caused the mine to be flooded and dewatering was necessarily delayed in the years that followed.

In October, 5 mo after the fire was discovered, normal operations were resumed in the affected section. The following account is an informal journal of LNC's fire-fighting operations during that period.

As shown in the accompanying plan and section, the fire was found in a massive coal formation, which is

typical of Mammoth vein anticlines, as an elevation of 343 ft in Chute No. 10 of the 5th-level West Skidmore southip gangway off Tunnel No. 526.

The first requirement was to try to establish the limits of the fire area so that the best means of extinguishing it could be applied. It was thought that if the fire was confined, pumps could be installed to flood the local fire area through small-diameter drill holes. On the other hand, if the fire was too large to be put out by these methods, a hard decision—flooding the section—would have to be made, and in this instance the hard decision was necessary. This step was taken only after long-hole drilling proved that the fire extended upward at least to an elevation of 353 ft and after further prospecting progress was prevented by fumes.

During July, flooding plans were formulated and refined, dams were

designed to confine the water as close as possible to the fire and materials were procured.

PLANNING FOR FLOODING

LNC's top management—Evan Evans, president; D. C. Melms, vice president, and W. J. Parton, general manager—headed the fire-fighting organization. Management decisions were converted into plans by the mining engineering department, under F. E. Sterner, chief mining engineer. The company's operating staff, including Norman Richards, general superintendent; G. H. Lovell, district superintendent; T. F. Price, general inside foreman; and Anthony Arieta, mine foreman, No. 4 mine, supervised the work at the scene of the fire. Engineering control of the operation was the responsibility of Walter James, district engineer, Lansford district.

The broad plan involved (a) isolating the fire section without interfering with production in other sections of the mine, (b) flooding the isolated section between the 5th level and the 4th level above it to extinguish the fire and (c) recovering the flooded section without adding to the existing pumping facilities.

The engineered fire-fighting set-up was characterized by two major features, as follows:

1. Seven well-designed and solidly-constructed dams confined 46 million gal of water in the fire area under pressure heads ranging from 137 ft to 206 ft.

2. The water circuit laid out by the engineering department permitted the water normally pumped from the mine to be dropped into the fire area and later recovered from the section by the main pumps, thereby eliminating any load on the surface water supply.

The six new dams and an older dam already in place were located as shown on the mine map.

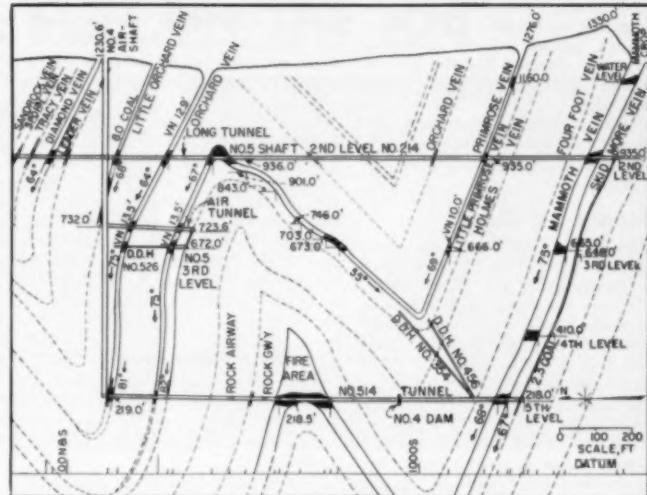
DESIGNING THE DAMS

The water problem being what it is, the use of dams is not uncommon in anthracite mines, and Old Company engineers have in their files an empirical dam-design formula which has been tested and proved on other occasions. It reads as follows:

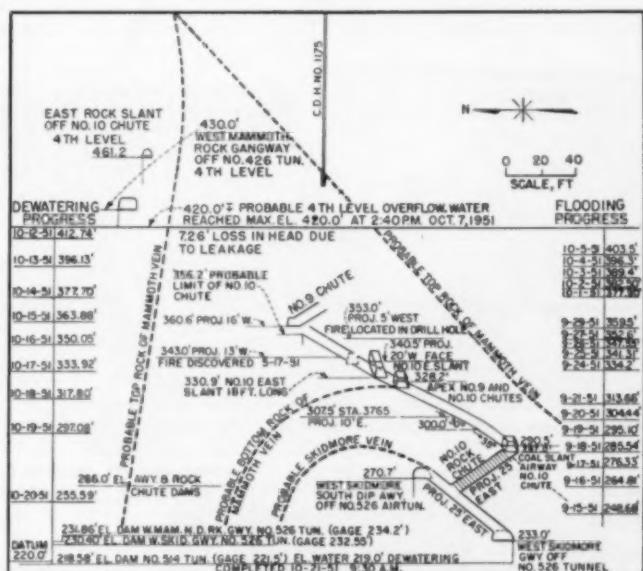
$$T = 3PW \sqrt{4R - 1}$$

$$S_c$$

In the formula, T is the thickness of the dam, in inches; P is the pressure of the impounded water, in lb per sq in (feet of head \times 0.434); W is the width of the mine opening, in feet; R is the radius of curvature of



SECTION E-E (from plan) shows how massive coal formation in Mammoth vein anticline present a hard-to-solve fire-fighting problem.



DAILY PROGRESS in flooding and dewatering was read from gages at dams and plotted by Lehigh Navigation engineers.

the outby concave face of the dam, in inches; and S_c is the compressive strength of the brick, in lb per sq in.

Brick for the dams was required to meet a specification of 6,500 lb per sq in, compressive strength, and each delivered load was sampled and tested in the company's laboratory.

Radius of curvature, R , is set at

1½W to provide an arch that will better transfer stresses into the faces of the side hitches and not against their outby ribs.

In using the formula, S_c was reduced to 1,500 lb per sq in, thus introducing a safety factor of about 4, and Dams 1, 2 and 3 were further buttressed with vertical 60-lb rails

on 2-ft centers with horizontal rails in the bottom hitches.

A 1:2 mortar mix (1 cement:2 sand) was specified for the job to provide high strength and better workability.

For controlling the flood, each dam was pierced by an 8-in steel pipe which was fitted with a pressure gage and gate valve.

BUILDING THE DAMS

Hitches for the first dam were started July 30, and the sixth dam was completed 43 days later on Sept. 11. Crews consisting of two masons and seven laborers worked four 8-hr shifts per day throughout the job. More than 176,000 brick and 1,979 bags of cement were required.

In building the dams, each course of brick was laid out, then covered with mortar which was brushed into the mortar spaces. Hitches were completely filled with brick and mortar

to obtain the tightest possible seal, although strata around the dams was not grouted because the installations were not intended to be permanent and the expected leakage could be tolerated.

On Aug. 17, the fire fighters were encouraged when roof spill in Tunnel No. 520 revealed that the fire had traveled westward and down where the peak of the anticline is lower, rather than eastward along the rising anticline. It is deduced that air currents in the tunnel drew the fire westward, thus reducing the threat to abandoned workings in the overlying 4th level.

Circulated Water Drowns Fire

Concurrent with underground dam construction, surface operations during July and August prepared the water circuit for flooding the isolated section.

Waste water from the east side of

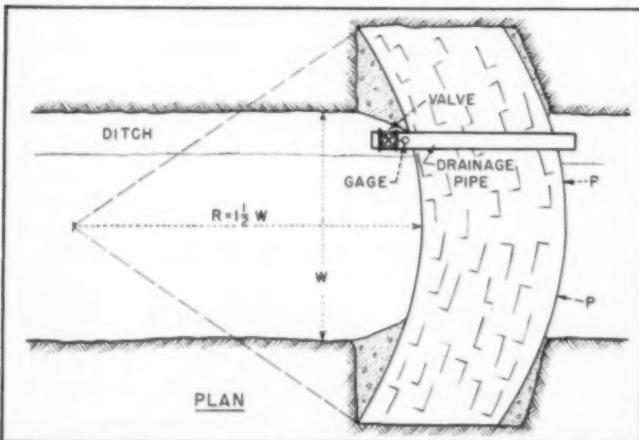
No. 4 mine flows west to 5th level main pumping station, which lifts the water to a water-level tunnel that in turn discharges to the surface. An old reservoir on the surface was repaired to receive the run-off from the mine and impound it for drowning the fire. To return this water to the isolated fire section, a 12-in wood pipe line was laid from the reservoir to No. 4 airshaft, and a 2,000-gpm pump was installed at the reservoir to pump water through the wood pipe to the shaft where the water was dropped into the sealed section. Earlier attempts to drop water through old boreholes were unsuccessful because the holes had become choked.

The flood progress chart, compiled from gage readings taken at the dams, shows the rate of rise of the water and the eventual rate of recovery.

In recovering the flooded section, the valves at the dams were opened to release sufficient water to keep the main pumps working at capacity. Water from the flooded section followed established drainage lines back to the pumping station and through the open spillway of the repaired surface reservoir to waste. The major advantage of the recirculating system was the elimination of overloads on the surface water-supply system.

After the section was completely dewatered, three dams were blown out to reopen ventilation and haulage circuits and normal operations were resumed.

In recounting the story of the anxious days, the coal company executives praised the excellent planning of the operating and engineering departments along with the workmanlike job done by the dam-construction crews. The supervisors, planners and workers prevented property damage that could have reached a staggering figure.

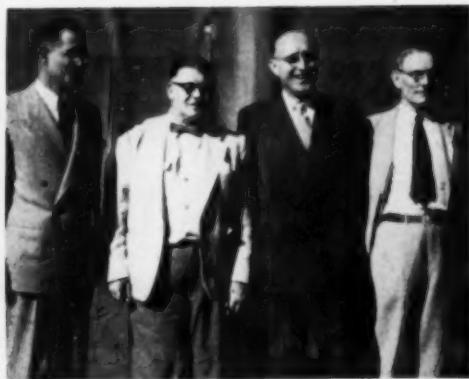


ARCH DAMS result from the application of LNC's design specifications.

Dam No.	Location	Thickness, Ft	Radius, Ft	Hitches, Sides, Ft Top-Bottom, Ft	Materials, Bricks Cement (Bags)	Construction Dates	Elevation, Ft	Expected Head, Ft
2	Rock Chute	4	No Radius	4.5 3.25	11,666 146	8/8 - 8/12	268.0	157
1	Rock Chute	5	No Radius	3.3 3.0	15,726 181	8/13 - 8/16	266.0	160
4	Rock Tunnel	7	18	3.0 3.5	26,637 310	8/17 - 8/21	219.0	206
3	Skidmore (Thin Vein) Airway	6.7	18	7.0 4.0	45,822 485	8/21 - 8/30	266.0	159
5	Rock Gangway	6.7	19	6.25 3.25	36,828 419	8/30 - 9/4	231.86	193
6	Skidmore (Thin Vein) Gangway	6.5	19	7.0 3.25	39,650 437	9/5 - 9/11	230.4	195

SIX NEW DAMS, listed in the order of construction, required more than 176,000 brick and over 93 tons of cement.

COAL MEN ON THE JOB



DUQUESNE LIGHT CO., COAL DEPT.: Company President McCance (left) and Vice President Jens (right) with, left to right, John Stephenson, superintendent, Warwick mine; J. E. Elkin, general superintendent, Coal Dept., and J. H. Trux, superintendent, Harwick mine, as they display the certificates Warwick and Harwick employees won in Duquesne Light's 1951 "Year Long Safety Campaign." Warwick had the best record for the year, while Harwick won the fourth-quarter contest with a no-accident record.

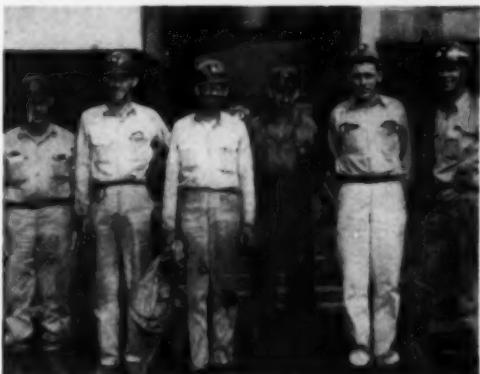
KANAWHA VALLEY MINING INSTITUTE OFFICERS (right photo): Lee M. Morris (left), manpower director, DSFA, and former institute secretary; Rush Meadows, newly elected president; P. O. Hamer, past president, and C. L. Milligan, institute executive vice president.



PEABODY COAL CO., Mine No. 40, Galatia, Ill. (above left): Carl C. Edwards (left) section foreman, and C. E. Bratten, division engineer, snapped underground in Mr. Edwards' section.

OLGA COAL CO., No. 1 mine, Coalwood, W. Va. (above right): C. Hickam (standing, left), underground construction and ventilation foreman; Roscoe Hensley, second-shift construction foreman; Joe Farris, outside maintenance foreman; W. A. Laird, superintendent; H. Hickam, general mine foreman; A. L. Lindley, master mechanic and Jack Burnett, assistant mine foreman. Everett Blankenship (seated, left), Dodge Puckett, J. D. Ratliff, Albert Johnson and Ralph Jones, section foremen.

BLACK STAR COAL CO., ALVA, KY.: John Aslinger (left, right photo), superintendent; Hobart Step, haulage foreman; Arthur Troutman, general mine foreman; George Fultz, tipple foreman; R. L. Nichols, plant manager, and Harry Gaunt, assistant to the president





THESE GENTLE ROLLING SLOPES once were steep hillsides, then rough spoil banks. Now, contoured to farmers' specifications, they grow lush crops of clover, oats, corn and grass. Better farm land results from lifting and aerating shale and breaking up hard clay. Prosperous farmers are building new barns and enlarging dairy herds.

How a Pennsylvania Operator . . .

PLANS mining and reclamation together—HELPS his farmer friends prosper

MAKES farm lands better than before—EARNS the goodwill of his neighbors



STEP 1—Shovel technique integrates stripping and reclamation. Banks are partly leveled by dozers.



STEP 2—Final cut is filled with bank material and topped with clay and topsoil from highwall.

These four steps show how Minns Coal Co. strips, fills and restores



MR. MINNS directs land restoration as well as stripping operations. Farmers gain by his foresight.

By WALLACE McGREGOR
Graduate Student,
University of Illinois,
Urbana, Ill.

Better Farms From Strip Land

STRIPPING AND RESTORING LAND in one operation—that's the way the Minns Coal Co., Du Bois, Pa., holds down the cost of reclaiming stripped acreage, builds good will among farmers and performs a public service.

Here's how Tom Minns, owner of the company, superintendent and foreman, does it:

1. Land restoration is carried out as an integral part of the stripping job, the overburden from each cut being partially leveled by a bulldozer as it is cast.

2. The farmer is called in to tell how he wants the final contour shaped and sloped.

3. A 'dozer, following the farmer's directions, fills the final cut and slopes off the hillsides, formerly too steep for plowing, to gentler grades suitable for cultivation.

That's why farmers in the Beechwood district, near Du Bois, greet Mr. Minns with friendly smiles. They are grateful to him because:

1. He has carried his land-restoration work far beyond the letter of Pennsylvania law.

2. He has helped farmers get back on their feet.

3. With good crops from restored lands, farmers have been able to buy new equipment, build new barns and add to their dairy herds.

4. Young men who had left home because the old farms would not provide a family livelihood have returned to help reap the harvests from the new lands.

The business is a small one, with Mrs. Minns doing most of the book work and, as pointed out, with Mr. Minns doing all the managerial and supervisory work. That way, overhead is kept at a minimum and Mr. Minns can include complete land restoration in his plans and still turn a profit.

The Minns Coal Co. at present is stripping on the Hicks & Welsh property at Beechwood, recovering an isolated patch of coal lying beneath a hill. The hill rises a maximum of 80 ft above the coal. From the total of 20 acres, it will be possible to recover 10 to 12 acres before running into old workings that occupy the center of the patch. These old workings formerly were operated by railroads,



STEP 3—Earthmover pushes fill into cut as restoration nears completion. Finished land is in background.



STEP 4—Last stage before planting shows gentle contour. Before stripping, land was too steep for plowing.

coal land for better farming, with profits for company and landowners.

wherever roof conditions permitted underground mining. When the railroad companies withdrew, they sold the land and the remaining coal to the farmers. The land is marginal, drainage is poor and the hillsides have been left to weeds and wild berries.

The present operation is in the Upper Kittanning seam, which holds fairly constant at 30 in in thickness. In planning its work, the company took advantage of the slight dip to the southwest and placed the entry at the lowest point to facilitate drainage and to give the loaded trucks the advantage of a downgrade when leaving the pit. The plan was to circle the hill with cuts following the outcrop in both directions from the entry.

Two high-front shovels remove the overburden—a Manitowoc 3500 and an Osgood 1006. Both shovels are diesel-powered and have 2-yd dippers. With booms set at 60 deg, the units have a digging height of about 60 ft and a dumping height of 50 ft. Digging radius is 55 ft; dumping radius, 51 ft.

The first cut in the present operation was made 60 to 70 ft wide, a strip of weathered coal being left in place on the outcrop edge. Inside curves were largely eliminated in making the first cut, thus insuring plenty of room for subsequent cuts. In later cuts, two HD-19 'dozers have been used with the shovels, one to remove the top 5 ft of clay and the other to push back spoil from the tops of the dumps. With the help of the 'dozers, pit width can be maintained in spite of the increasing depth of cover.

Very little shooting is required. The overburden consists mostly of rotten shale and the shovels can dig into it easily. In one half of the pit, however, there is a 2-ft band of hard sandstone. Where this appears, horizontal

holes are drilled beneath it with a Hardsco auger drill. Holes run 40 to 50 ft into the highwall on 30-ft centers and are 4½ in in diameter. The rock is broken with 40% gelatin, 100 lb per hole, with Primacord running the full length of the hole. The Primacord is attached to a trunk line and fired electrically.

The coal, like much of the overburden, is not hard enough to require shooting. A Bay City 1½-yd shovel loads the coal into a fleet of eight trucks for the 5-mi trip to the tipple. The coal is removed completely from each cut before the next cut is started. Since the bottom rock, being hard, provides a good base for pit haulage roads even in wet weather, there would be little gain in leaving a bench of coal for shovels and trucks to run on. Before loading, the surface of the coal is cleaned with a Warco diesel grader, which also maintains the haulage roads. Four 3-in Barnes gasoline-powered pumps are kept on hand for emergency drainage.

Mr. Minns employs only 20 men all told—three shovel operators, four 'dozer drivers, two drill operators, two truck drivers, a mechanic, four tippie hands and four laborers. All his men have been with him 5 yr or more. They work only one 9-hr shift. Mr. Minns finds that machinery maintenance is much less a problem on one-shift work than it would be on two-shift operation.

In the Minns operations, land restoration proceeds hand-in-hand with stripping. The bank from each cut is partly leveled by a 'dozer as it is cast. After the last cut in a patch has been made—the stripping limit is about 50 ft of overburden height—the farmer is called in to decide how he wants the final contour shaped. An HD-19 then fills the final cut partly with material

from the banks, particularly the large rocks, and partly with material from the top of the highwall itself. In this way, the steep hillside slopes, formerly too steep for plowing, are cut down to gentler grades that can be farmed. To make restoration easier, shovel operators avoid building high banks.

On one farm of 25 acres, 12 acres was stripped to recover a 48-in seam of coal, yielding 80,000 tons. The farmer was off his land for 2 yr, the restoration being completed in 1948. On another farm, two separate areas totaling 32 acres were worked to recover 400,000 tons of coal from two seams, the top seam being 48 in, the bottom seam 36 in, with about 80 ft of shale between. The stripped areas did not overlap. Restoration was completed 2 yr ago.

When Mr. Minns entered the district and began stripping, the farms were in poor condition. He offered the farmers a royalty of 30 to 50¢ per ton and guaranteed to restore the land to its original condition.

Actually, he has far exceeded his guarantee. Farms have been recontoured to provide favorable drainage. Steep hillsides have been eliminated. Large areas have been made suitable for cultivation. The dead, sour gray shale has been lifted and aerated and the hard yellow clay has been broken up. Mixed together, they now provide nourishment for thriving crops of clover, corn, oats and grasses.

In addition, agriculturists from Pennsylvania State College have made soil tests and advised farmers on the types of crops to plant. Both lime and fertilizer are applied before planting.

Farmers are pleased with the results. On his side, needless to say, Mr. Minns has no trouble whatever in lining up new contracts with other farmers who have coal beneath their fields.



RED CLOVER THRIVES on land restored 3 yr ago. Clover makes soil richer while providing forage for herds.



ABUNDANT HARVEST from stripped acres is stored for winter use in barn at the end of the mine-entry road.

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ARE YOUR BEST POWER BUY— AT ANY PRICE

They PROVIDE ample power for fast, high-production haulage—more trips per shift, dependable round-the-clock performance, with no end-of-shift slowdown, no unscheduled down time . . . ASSURE inherent safety, with freedom from hazards of fire, fumes, noise . . . SHOW low costs of operation, maintenance, repair, depreciation. SIZES for all makes of battery-powered mine locomotives, trammers, shuttle cars. Call in an Exide Representative and let him prove these facts.

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Operating Ideas

Mechanized Unit Doubles Track-Cleaning Efficiency

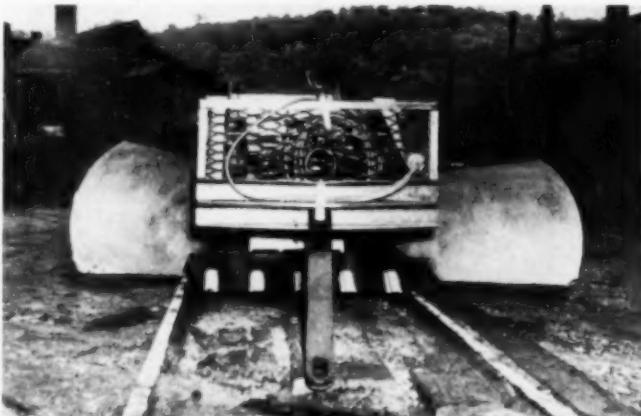
TRACK CLEANING at Blaine mine, Lorain Coal & Dock Co., Blaine, Ohio, is being done easier and faster with a new mechanical track cleaner designed and built by the American Mine Door Co., Canton, Ohio.

The business end of the new unit is equipped with an adjustable digger plate which picks up dirt or spillage between the rails down in the tops of the ties, and two adjustable wings which clean up outside the rails. Material picked up by the digger plate and wings is fed to a central conveyor which carries it up over the machine into a mine car for disposal.

Both the digger plate and wings are hydraulically controlled to permit the machine to clear obstacles between the rails and to compensate for changes in side clearance.

Two locomotives are used with the cleaner, one to haul it while it works and the other to make the required car changes. A telescoping coupling between the track cleaner and car permits the back of the car to be loaded first, then the middle of the car, then the front end, as the coupling is automatically lengthened while the unit operates.

At Blaine, the cleaner is in operation on three late night shifts per week. Its big advantage is that it more than dou-



MECHANIZED TRACK CLEANER efficiently cleans a lot of track in a short time. Digger plate (between rails) can be raised or lowered and wings raised, lowered or spread, hydraulically, to provide the required flexibility for cleaning mine track.

bles the length of track that can be cleaned, as compared to hand methods, with less labor. Now, three men load about 12 cars per shift; before, four men did well to load six cars. The machine can be operated by two men.



WINGS AND DIGGER PLATE (left) direct dirt or spillage into central conveyor which loads mine car (right) coupled to the cleaner. Telescoping coupling between track cleaner and mine car permits the car to be loaded in three stages.



GOULD
Plus-Performance
Plan



Mining batteries
should be cleaned
whenever any quantity
of dirt has accumulated.

GIVES YOU
THIS TIMELY TIP—

CLEAN BATTERIES LAST LONGER!

Because battery cleanliness prevents external current leakage and grounds, regularly scheduled cleaning is essential for maximum battery service. Information on proper battery maintenance is available to you through the GOULD PLUS-PERFORMANCE PLAN—a complete system of manuals, articles, specifications, bulletins, charts and graphs dealing with this and practically every other battery problem.

GOULD PLUS-PERFORMANCE PLAN material tells you and shows you how to select, charge and handle, maintain and determine the condition of your batteries . . . and it's FREE, without obligation! Use it and you can extend battery service as much as 50%! Send today for booklet explaining the plan.



The Gould "Thirty"
with "Z" Plates—
America's Finest Mining Battery

HERE'S HOW TO CLEAN YOUR BATTERIES

Batteries should be kept clean and dry. When cleaning be sure all vent plugs are in place and tight. Wash batteries with water, then blow off excess and dry with compressed air. Neutralize acid on covers and other parts of the battery with ammonia or baking soda at least once a month. Terminals and connectors should be cleaned with baking soda and water. Lead plated connectors and terminal lugs should never be scraped—scraping damages the lead plating and exposes the copper to corrosion. Use No. 00 sand paper or suede brush for such cleaning.

GOULD

STORAGE BATTERIES
GOULD-NATIONAL BATTERIES, INC., TRENTON 7, NEW JERSEY

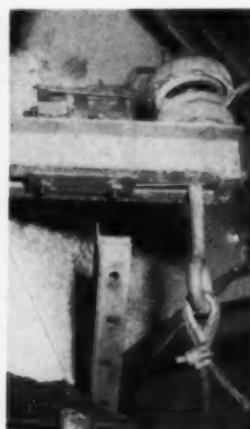
Always Use Gould-National Automobile and Truck Batteries

Change in Feeder Weight Indicates Coal Level in Hopper

SPRINGS SUSPENDING a vibrating feeder at the Indian Ridge mine of the United Pocahontas Coal Co., Crumpler, W. Va., serve as a weighing device to operate a dual-purpose signal that indicates, first, whether there is coal in the hopper, and later, when the hopper is about empty.

At this property, a Jeffrey-Traylor vibrator feeds from a 500-ton drop-bottom-car hopper to a belt conveying 750 ft downhill to the preparation plant. The operator at the bottom of the hill needs a signal for starting and stopping the belt. If, however, the hopper is permitted to become completely empty, the next coal dumped comes in with such force that some of it is carried through and across the feeder, thus overloading the belt.

In looking for a simple, inexpensive and sturdy means of operating a signal switch, J. C. Snyder, chief electrician, hit on the idea of using the compression and expansion of the feeder's suspension spring to operate a micro switch. The micro switch was necessary because the springs are heavy coils and compress very little with the extra load imposed by the coal. Movement is multiplied by a lever which, on its short end, has an adjusting



screw resting on the top of the hanger-rod cap (right photo). The lever's long end rests on a short leaf spring, which in turn operates the micro switch when deflected. The micro switch is attached to a coil spring out of sight at the right

of the left photo, which is similar to "A."

The indicating signal is an ordinary 60-w lamp mounted on the outside of the headhouse. Although 750 ft away, the operator can see the light plainly from his control station.



Fan-Signal Change Eliminates Bearing Maintenance

CHANGING from flow to pressure operation of a fan signal eliminated bearing maintenance at the Indian Ridge mine, United Pocahontas Coal Co., Crumpler, W. Va. With the vane in the airway as originally installed, a continuous flutter wore the cups and pivots of the bearings.

In the new application, the entire unit is outside the airway and there is no movement of parts unless the fan stops. The vane which, because of gravity, would hang vertically if free, is sucked to a 45-deg position against the end of a short pipe extending through the wall into the airway. It is self-setting since the inrushing air blows the vane against the hole where suction pressure holds it.

As shown in the photograph, the box housing the mercury switch and vane is on the outside wall of the building. Although sheltered by the eaves, the units are further protected from snow or ice by metal covers. The slot in the left-hand cover or housing is positioned to cause the air current to swing the vane against the opening on starting of the fan.

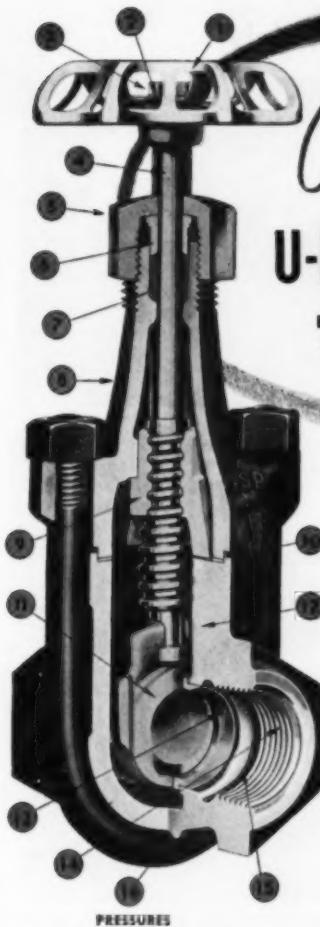


Locked Cabinet Keeps Safety Lamps in Good Shape

LESS CHANCE of loss or damage is the major advantage of this mine-built safety-lamp cabinet designed by L. S. Lyons, superintendent, Roda (Va.) mine of the Stonega Coke & Coal Co., who is shown here pointing to the individual lamp racks. The cabinet has two sections—one for each shift—and both sections have a lock. It was made from an old tipple screen and other scrap iron by Frank Turner, of the Roda shop.

WOULD YOU LIKE TO SEE YOUR IDEA PUBLISHED?

—Other coal men will profit from learning how your good "Operating Idea" works and COAL AGE will gladly pay you \$10 or more for each usable idea, on publication. Just write: The Editor, COAL AGE, 330 W. 42nd St., New York 36, N. Y.



Only Jenkins
U-BOLT GATES

**measure up to this
16-point standard**

- 1. Perfect-Grip Handwheel**
- 2. Valve Index Plate**
- 3. Secure Wheel Nut**
- 4. Heavy Manganese Bronze Spindle**
- 5. Large Packing Nut**
- 6. Self-centering Packing Gland**
- 7. Deep Stuffing Box**
- 8. Heavy Duty Bonnet**
- 9. Unique Renewable Bonnet-Saver Bushing**
- 10. Body-Bonnet Safety Joint**
- 11. Extra-WideGauge Reversible Bronze Wedge**
- 12. Heavy-Duty Body**
- 13. Bronze Seal Rings, Expanded In**
- 14. Full Length Pipe Threads**
- 15. Liberal Diaphragm Clearance**
- 16. Strong U-Solt**

Bronze Mounted or All Iron—Sizes 1" to 3"

TROUBLE IS RULED OUT! Check these 16 advanced features—for wear-resistance . . . for ease of maintenance. From handwheel to diaphragm, notice how thoroughly trouble has been ruled out in designing this U-bolt valve. No other valve in its class measures up to Jenkins U-bolt Gate on all these points, many of them exclusive.

You can take it apart and put it together again in two minutes, and it's a cinch to clean. When operating threads become worn, just slip in a new "Bonnet Saver Bushing" and restore it to new-valve efficiency. It's a favorite for those plumbing-heating, mine, mill or any services where excessive sediment is tough on valves and where freezing is a hazard.

For "renewability" without waste, bull-necked endurance, and low upkeep cost, you can't beat Jenkins U-bolt Valves. Yet they cost no more! Full details and specifications in new circular, Form 179-B. Jenkins Bros., 100 Park Avenue, New York 17. Jenkins Bros. Ltd., Montreal.

Sold through leading Industrial Distributors



EASY TO CLEAN— You can really get into the bonnet of this valve to clean out the chamber above the operating threads.



RUGGED CONSTRUCTION — Here's proof. When the U-bolt nut was tightened down with a 14" socket wrench until the high tensile steel bolt broke, the heavy duty body and bonnet did not crack.

JENKINS

LOOK FOR THE DIAMOND MARK

VALVES

SINCE 1894 TRADE JENKINS MARK

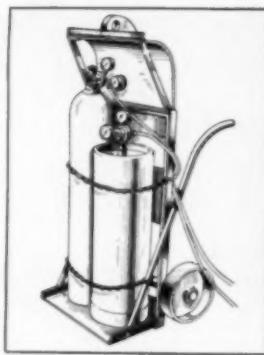
COAL AGE : March 1912

How To Handle Gas Cylinders Safely

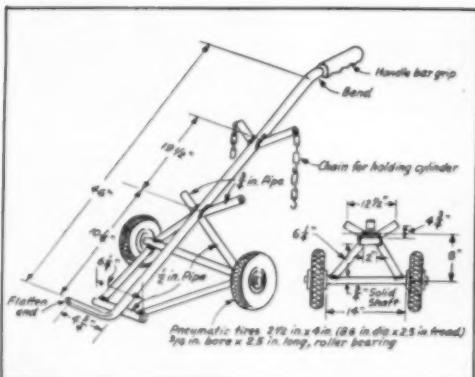
ROUGH HANDLING can cause serious damage to oxygen and acetylene cylinders, and, more important, to fingers and toes, according to Linde *TIPS*, a magazine published by Linde Air Products Co. While cylinders are safely and strongly built, they still should be handled with care to prevent knocks or falls.

Every shop should have trucks or stands that will not only prevent damage to cylinders but also to fingers and toes. The cylinder carriers shown in the illustrations are designed to provide easier handling for the operator. Though some of these carriers may be purchased, all of them can be made from materials that are easily obtained, usually from the scrap pile.

Wheeled trucks are particularly useful in shops, and hand carriers in the field.



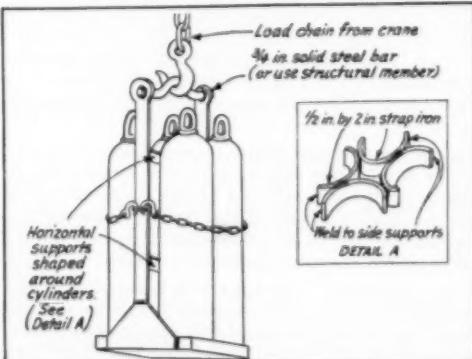
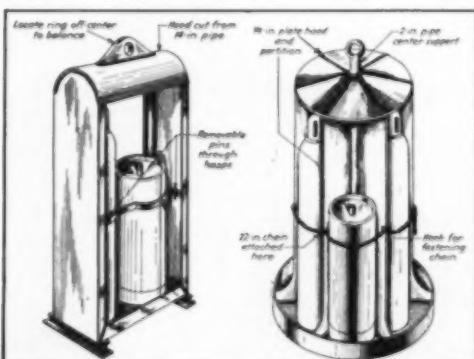
TWO-CYLINDER TRUCK (left) carries one cylinder each of oxygen and acetylene and doubles as a cradle. Balanced cradle for safe unloading and handling (right) is much easier on both workmen and cylinders.



LIGHT TRUCK, made from $\frac{1}{4}$ - and $\frac{1}{2}$ -in pipe, is particularly useful for changing manifold cylinders because it is easy to handle and load.



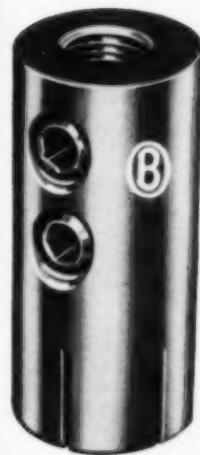
TWO-MAN HAND CARRIER holds either an oxygen or acetylene cylinder. Pipe is easier to use in making the carrier, but angle iron also is a possibility.



SAFE HOIST CRADLES include one built to prevent cylinders from falling out or being damaged by slamming against obstructions (left). Two-cylinder carrier (center) has a hood for protection against falling objects. Cradle or carrier at the right can be used for handling cylinders with a crane.

HAULAGE WAYS Jr.

H-3 Terminal
No. 22241 takes No.
14 to No. 2 Cable.



H-1 Terminal
No. 22092 takes No. 6
to No. 2/0 Cable.



H-2 Terminal
No. 22093 takes No. 1
Cable.
No. 22094 takes No. 2
and No. 3 Cable.
No. 22152 takes No. 4
Cable.

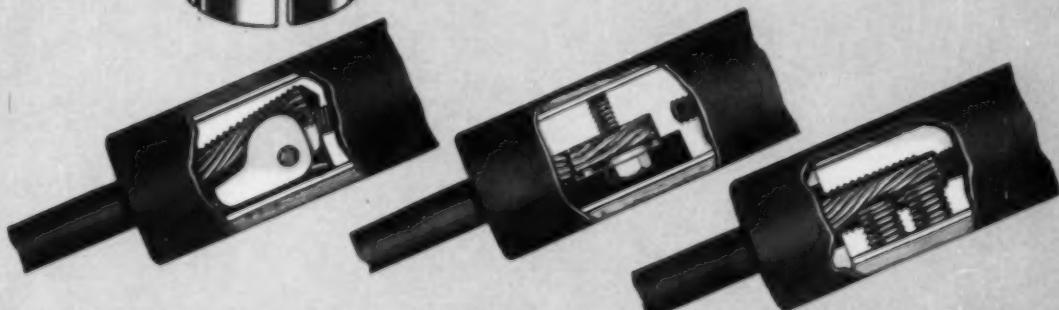
O-B Tap Terminals Hold Cable Tight!

Strong enough to withstand the severest sort of jerks and strains, these Terminals in O-B Fused Taps are able to banish cable pull-out troubles wherever fused taps are used in your power distribution system. By offering three styles, O-B provides a tap terminal suitable for every operating condition or requirement. For speedy attachment, the H-1 Terminal grips a bare cable end just as quickly as two set screws can be tightened. A hammer, if it's handy, or a rock or a piece of wood is enough to hammer the H-2 Terminal cam into place on a cable end - no tools are needed. And a revision of an older tap terminal - the H-3 - is offered because of its proved popularity with a number of mining properties.

These tap terminals, furnished with O-B Form-H and Form-J Taps, take a good hold on trailing cable and *hold tight!* When you use O-B Taps, the strongest cable-holding terminals available are working for you!

Ohio Brass
MANSFIELD  **OHIO, U. S. A.**

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



HAULAGE WAYS Jr.

Good ways to get extra use from your roof bolts

If you are bolting to get good roof, you'll be interested in some of the "extras" that can be worked into your bolting program. The illustrations here show some of the things that are being done to get "double duty" from roof bolt installations without interfering with bolt strength or efficiency. Two photographs of O-B Line Materials show how feeder cable can be hung from roof bolt installations. Metal brackets and 2 x 4's in the others show how commonplace materials already on hand can in-

crease the utility of your roof bolting. Perhaps you can use these ideas; perhaps they'll suggest uses you can turn to your advantage.

But whether or not you use the "extras," here's an important thing to remember about bolting: O-B Roof Support Expansion Shells and Plugs, used with either threaded rods or bolts, can develop the full tensile strength of the rod or bolt. Use these shells and plugs to improve - and simplify - your roof bolt installations!



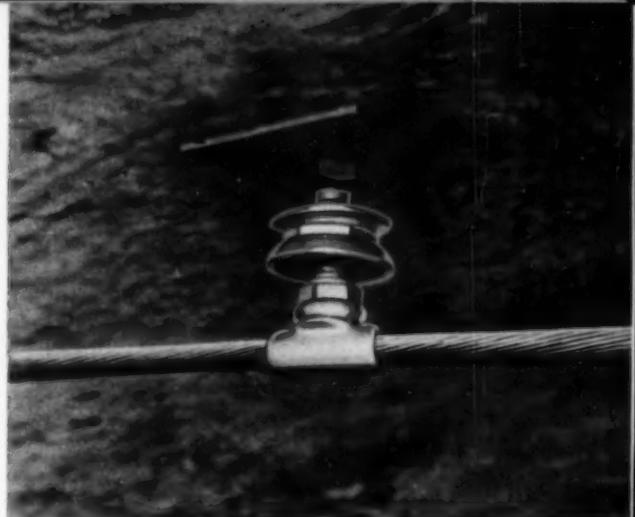
Two ideas shown here are interesting. The metal bracket under the bolt head is ready at any time to hold trailing cables up and out of the way. The spool is held by a stud, welded to a wedge which is driven under the plate.

The timber is not meant for additional support, as you might expect. Put up as a part of the routine bolting cycle, the 2 x 4 provides a convenient method for hanging brattice cloth.



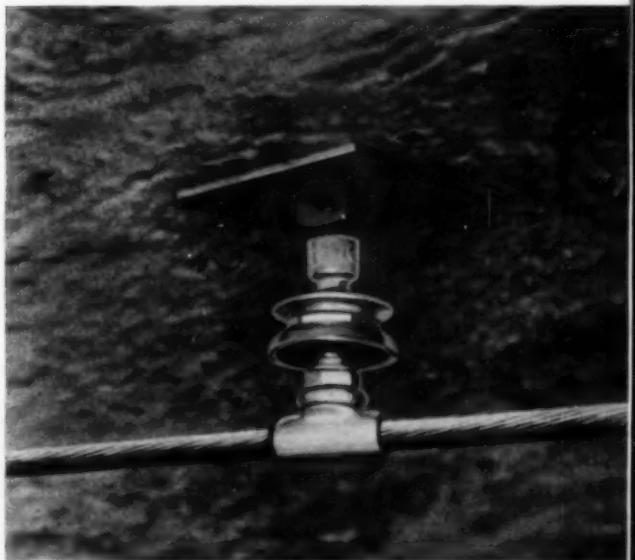


O-B Roof Support Expansion Shells and Plugs are your best bet for bolting with $\frac{3}{8}$ inch threaded rods or $\frac{5}{16}$ inch bolts. Properly installed in right-size holes, these shells and plugs can develop the full tensile strength of the rod or bolt.



Put those threaded rod ends to work! O-B Type K-3 Hangers, No. 22015, turn onto the ends of $\frac{3}{8}$ inch rods; give a method for hanging feeder cable or other overhead equipment. An O-B Bulldog Feeder Sling completes the assembly here.

Another good ending for a protruding roof support rod. O-B Vertical Pipe Adapter No. 22155 for 1 inch rod provides attachment means for overhead hardware.



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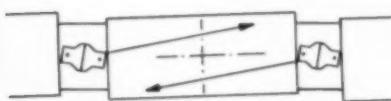
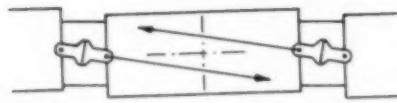
HAULAGE WAYS, Jr.

Hold Trips in Line With *O-B Couplers*

**Coupler Mounting Imparts
Stability to Each Car**

Counteracting the normal tendency to zigzag on the track under push or buff, O-B Automatic Mine Car Couplers actually work to maintain mine cars in center-to-center alignment. This track-stabilizing ability of the O-B Coupler is achieved by replacing the single pivot point (common in ordinary automatic couplers) with a pushing face five inches wide between the car and the coupler. Thus, when cars tend toward a skewed position on the track, the bearing faces exert a contrary force which forces the cars to retain their center-to-center alignment on the track.

Two moment diagrams here show how the ordinary coupler and the O-B Automatic Mine Car Coupler affect car stability under push or buff. Why not ask your O-B representative to go further with the explanation. He can explain the track stability feature - and all the other advantages of O-B Automatic Coupling - to your complete satisfaction!

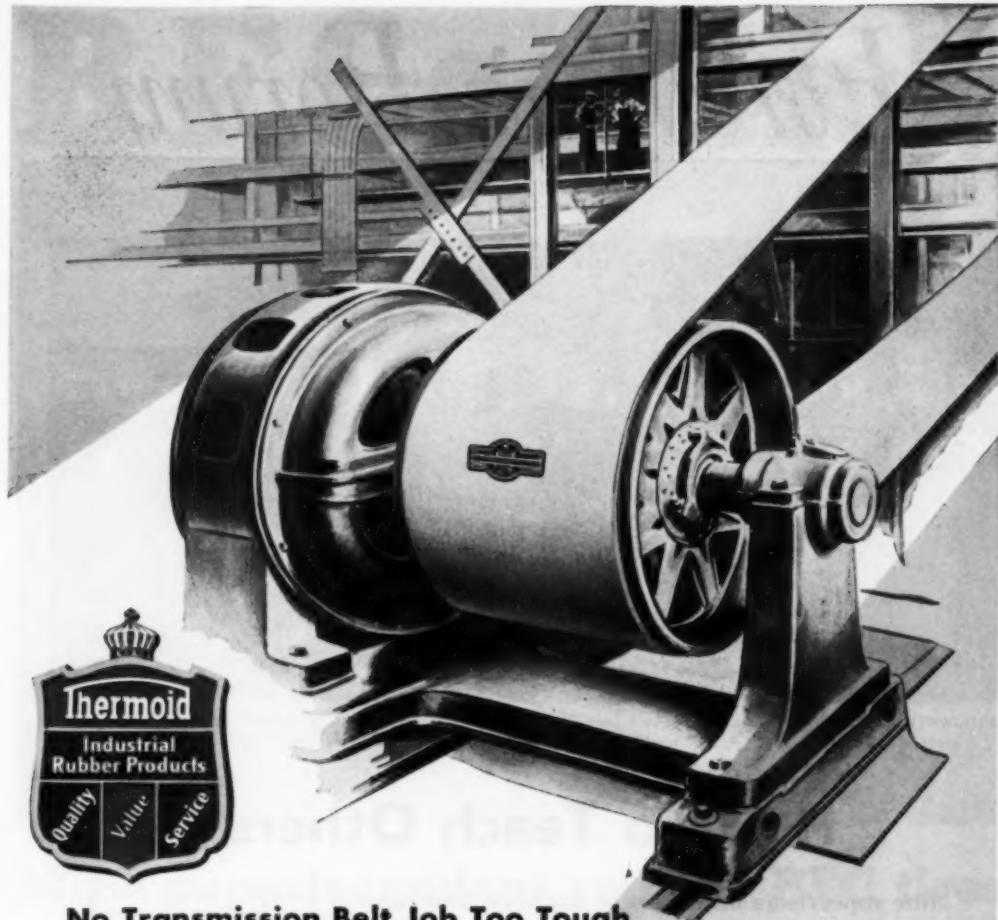


Ordinary automatic couplers transmit pushing forces through a single pivot point. Cars then submit to push or buff take skewed position on track. Derailments are possible when these forces are strong enough.

O-B Automatic Mine Car Couplers actually work to stabilize a skewed car. Pushing force is applied by corner of coupler shank, and is directed so as to move car into proper position. As soon as this takes place, entire end of coupler then bears on metal pad in draft gear to maintain this position.

4298-M

Ohio Brass
MANSFIELD OHIO, U. S. A.
CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.



No Transmission Belt Job Too Tough ...For Thermoid

Have you some really tough transmission jobs—regular belt killers? They won't be too tough for a Thermoid Transmission Belt. Let your Thermoid Distributor prove that by furnishing exactly the right belt for your job.

For general service he will offer "400", the all-purpose belt that will satisfactorily service all normal operating requirements.

For severe service, or for high speeds with small pulleys, he will recommend Thermoid High Speed "R", made with extra strong, hard 35-oz. duck and top grade rubber. Where there are oil or fumes injurious to rubber, he will recommend Thermoid High Speed "N", with Neoprene friction and skim. Each type is practically custom-built for the service for which it is recommended.

Here's The Book That
Will Answer Many of
Your Questions



Ask for your free copy of
Technical Bulletin No. 3678.
It contains practical information,
charts, tables and
diagrams which will help you
select the right transmission
belt for your requirements.

Thermoid

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

Foremen's Forum



GOOD INSTRUCTION does not always require a classroom. This mine foreman gives group instruction when and where he sees the need for it.



THIS SAFETY ENGINEER'S CLASS consists of one new employee.

How To Teach Others

Mine supervisors must also be teachers. You can teach if you know your subject, plan your presentation in advance, use tried and proved teaching methods and approach the job with sincerity

YOUR JOB undoubtedly requires that you do a certain amount of teaching, whether it be initiating a new employee into his mining job, leading a lunch-period discussion among your crew or actually acting as an instructor at a night school or in a first-aid course.

For the benefit of your students, whoever they may be, explore with us some of the factors that influence teaching and which can lead to good, bad or mediocre results. Here are six questions that will generate a discussion of some basic principles of teaching.

1. WHAT MAKES A GOOD CLASS?

Keeping in mind that a "class" may be a single individual, a section crew engaged in an informal bull session or a formal night-school or first-aid class, it is almost certain that any good class ex-

hibits some definite characteristics, as follows:

1. The teacher is prepared. He has a definite outline, prepared well in advance, and he has enough flesh to place on this skeleton to hold the interest of

2. The teacher sifts his material, searching for ways to apply the lesson content to personal experiences of his student or students. If advisable, he uses illustrations or visual aids to dramatize the material, but this doesn't mean he plays fast and loose with facts.

3. He dishes out no hokum. He realizes that if his teaching consists of presenting misconceptions, embellished truth and old wives' tales, he will be haunted when the students discover they have been duped.

4. The students actively participate in

the proceedings because their interest is aroused by the excellence of the instructor's presentation.

5. The instructor knows as much about his subject as he can possibly absorb, so he is better able to handle the questions that come up. He probes beyond the elements of the subject so that his teaching of the elements will be of highest quality.

Now let's examine an entirely different situation:

2. WHAT MAKES A BAD CLASS?

We are certain that if you ever attended a class that fell on its face you noticed some of these characteristics:

1. The teacher was unprepared. There was no point to the instruction. He groped for subjects to discuss and finally lit upon the idea of working a sample problem to kill time. But he came up with the wrong answer and was unable to find the reason for the error. Not only was the instructor personally embarrassed, but the students themselves felt sorry for him. Of course, they went away unsatisfied.

2. The outline was faulty, thus forcing the instructor to "shoot his wad" in the

B.F. Goodrich



Mine superintendent reports BFG tires outwear other makes two to one!

ABRASIVE flint rock covers the eight miles of underground roads operated by the Bilharz Mining Co., Inc., of Baxter Springs, Kansas. Carrying 10-ton loads, ordinary tires are cut and chewed to shreds in just a few weeks of service.

"Always eager to reduce operating costs," says General Superintendent Robert C. Wells (above), "I ran a series of tests between B. F. Goodrich tires and several competitive makes. These tests have proved to me that B. F. Goodrich tires will outwear the other makes tested two to one in this type of operation."

No wonder this company equips its vehicles 100% with B. F. Goodrich tires—from Tubeless and Mud-Snow tires on cars and Jeeps to Rock and Universal tires on loading and haul-

ing units. On this heavy-duty mining equipment BFG tires give Mr. Wells as many as 3,000 hours of service.

The reason for these outstanding service records lies under the tread rubber of B. F. Goodrich off-the-road tires. Rubber-coated nylon cords—the patented nylon shock shield—are built between the tread and tire body. These strong cords stretch together under impact to absorb and distribute smashing road shock, protect the cord body from damage.

Mine operators save 4 ways with this exclusive nylon shock shield: (1) more recappable tires for more miles per recap (2) increased tire mileage (3) greater bruise resistance (4) less danger of tread separation. This is why the Bilharz Mining Company reports BFG tires give better traction and cut

resistance, why Mr. Wells adds: "We will never go back to any other make."

Successful mine owners across the country cut operating costs with B. F. Goodrich off-the-road tires. Follow their lead. See your local BFG dealer, who will be glad to show you the B. F. Goodrich tire designed to answer your particular problems, or write direct to: *The B. F. Goodrich Company, Akron, Ohio*.



Knowledge, preparation, system—Hallmarks of good teaching . . .



first 15 min and then wander among the fringe issues or repeat himself for the remainder of the period.

3. The teacher was not well enough acquainted with his subject to satisfy the questions of his class.

4. Discipline broke down. It happened this way: Two opposite points of view arose from a certain question and the opposing factions tried to shout each other down. The teacher lost his authority to settle the issue because he wasn't armed with enough knowledge of the subject, so the class fell apart.

5. The teacher had the attitude that he knew all the answers. He spoon-fed the students to the point of boring them, thus killing the student-teacher cooperation which is a striking characteristic of all good classes.

The foregoing questions and their discussions bring out a fact that cannot be dodged—the instructor makes or breaks a class. Whether the class is an individual or a group, most adult "students" voluntarily approach an instructor to learn something they want to know, and if they leave empty-handed, the teacher must shoulder the responsibility.

Consider a third question:

3. WHAT ARE THE BIGGEST CRIMES A TEACHER CAN COMMIT?

Two overriding shortcomings dominate this discussion, and since it is a matter of question as to which is the greater offense, they are presented alphabetically, as follows:

1. Dishonesty in teaching is unpardonable, whether it is intentional or unwitting. If the instructor doesn't know the answer, he should not bluff because that is intentional dishonesty. He should tell the student he will get the answer; then keep his promise.

Unintentional dishonesty is more difficult to restrain. For example, the instructor makes a statement and then qualifies it a dozen different ways. The student hears the statement but not the qualifications, so he leaves the session with distorted information. If a qualified statement is necessary, the qualifications should be laid out in black and white before the statement is made, thus avoiding unintentional dishonesty.

2. "Giving up" on a student is taking the easy way out. It is natural for a teacher to want to spend most of his time with the sharper students because

that is more satisfying to the teacher. But satisfying the teacher is only a small part of education; a much larger part is satisfying the students, all of them. This might mean spending extra time and giving extra attention to the slow student outside the class to avoid keeping the brake on the others. However, those who learn hardest sometimes retain the most, thereby offering a testimonial to the teacher's ability and sincerity.

Having observed some of the characteristics of teaching, good and bad, let's turn to a discussion of the mechanics of teaching, with the emphasis on "good." That brings up a fourth question:

4. HOW DOES A GOOD TEACHER GO ABOUT TEACHING?

Most good instructors employ a definite step-by-step sequence in getting a lesson across to an individual or a group. The sequence can be briefly described as consisting of five steps, as follows:

1. Explanation.
2. Demonstration.
3. Interrogation.
4. Application.
5. Examination.

Usually, the first two steps are handled by the instructor and the last three require joint participation by both class and instructor. Again, the class may be an individual or a group. Here's how the five steps are used:

1. Explanation—First things first, the instructor presents a clear, comprehensive view of the material to be covered, setting the limits as to where the lesson begins and where it will end. Complicated ideas or mechanisms are reduced to their basic elements and carefully explained, point by point.

2. Demonstration—If the instructor is teaching his students to use their hands or bodies to perform a certain function, he must demonstrate how the acts are correctly performed. If there is a safe way to do the work and an unsafe way, he must be sure to demonstrate the safe methods first and foremost. It is sometimes desirable to demonstrate how not to do a job, but first impressions are lasting and proper methods should have center stage.

3. Interrogation—Here the students get their chance to participate. The instructor invites and answers questions concerning his explanation and demonstration. He makes a special effort to keep the discussion on the subject at hand.

4. Application—Under the watchful eye of the teacher, the student or students practice what they have learned. Errors in their methods or thinking should be detected and corrected at this stage of the instruction.

5. Examination—The only way to be certain that students have absorbed training is to test their knowledge. On the basis of the test results, the instructor can decide whether to repeat the lesson or go on to the next.

The five steps in the sequence may be used only once during an entire session or they may be used over and over, depending upon the nature of the mate-

rial. For example, a lesson in artificial respiration may require only one application of the teaching sequence, while a lesson in applying splints may require separate sublessons for back splints, leg splints, arm splints and so on.

Continuing on the mechanics of teaching, Question 5 deals with the use of training aids.

5. HOW ARE TRAINING AIDS USED TO BEST ADVANTAGE?

Training aids can help immeasurably, but only when they are properly used. Points to be considered are:

1. The instructor takes a big gamble if he uses a training aid he has not examined beforehand. He should be certain that he himself understands all the material contained in the display so that he can better explain it to the class.

2. He should be certain that the training aids apply directly to the lesson material so that there can be no conflict. Applicable training aids consolidate a lesson, but material that does not apply only confuses the issue.

3. If the training aid fits naturally into one step of the foregoing teaching sequence, that is where it should be used. In other words, if a training film demonstrates the proper way to do a job, it should be used after the instructor's explanation and before the interrogation period.

Finally, there comes the necessary duty of examining one's teaching efforts with the aim of improving the instruction for the benefit of the students.

6. HOW CAN THE INSTRUCTOR'S PERFORMANCE BE MEASURED?

This is a tough one. However, here are some indicators:

1. If the interest of the students holds up throughout the lesson the instructor has reason to be gratified.

2. Successful completion by the students of well-designed tests indicates the instruction is being absorbed.

3. If questions from the class (or individual) become more and more searching as the lesson moves along, it is almost certain that the students are keeping up with the instruction.

On the other hand, it may be difficult to rate teaching performance. Teaching is a long-term investment by the instructor, and the dividends may not show up for a long time. In this instance, all the instructor can do is watch his former students. If they make progress in their work he can be reasonably sure that some of his formal or informal instruction took root.



Department of Things as They Are

Will advise you in due course: If we figure it out, we'll let you know.



THE VICTAULIC METHOD OF PIPING



EASIEST WAY TO MAKE ENDS MEET



The Victaulic Method is the only complete, modern mechanical development in piping construction . . . offering a fast, simple hook-up that streamlines piping . . . cuts costs.

The Victaulic Method represents a comprehensive system built around easy to install, versatile Victaulic Couplings . . . world famous for quick, leak-proof pipe connections. For use with these efficient couplings, Victaulic offers a complete line of modern Full-Flow Elbows, Tees, Reducers and other Fittings . . . plus Victaulic's easy-to-use, portable Vic-Groover Tools for preparing standard pipe ends easily and quickly. Victaulic Couplings, Full-Flow Fittings, and Vic-Groover Tools comprise the complete Victaulic Method for fast, dependable, on-the-job piping.

For new construction, repairs or alterations . . . for any piping job, big or small, the VICTAULIC METHOD is the easiest way to make ends meet. Mis-alignments, expansion and contraction are automatically taken care of by Victaulic and locked-joint, leak-proof piping is assured.

Save time, work, and dollars on piping construction—make that next job ALL VICTAULIC. Write today for Victaulic Catalog & Engineering Manual No. 44-8A.

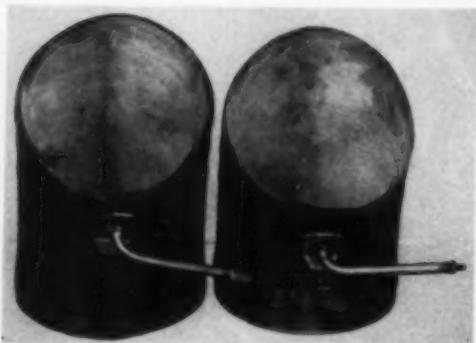
28th VICTAULIC YEAR

California: Victaulic Inc., 727 W. 7th St., Los Angeles 14
Canada: Victaulic Co. of Canada Ltd., 406 Hopewell Ave., Toronto 10
Export: Pipe Couplings, Inc., 30 Rockefeller Plaza, N. Y. 20, N. Y.

VICTAULIC COMPANY OF AMERICA

P. O. Box 509 • Elizabeth, N. J.
Office and Plant: 1100 Morris Ave
Union, N. J.
Telephone: ELizabeth 4-2141

Equipment News



New Shuttle-Car Tire Holds Air Pressure (1)

Designed to solve one of the major problems in the use of pneumatic tires on mine equipment, new extra heavy Goodrich tube developed for shuttle-car service eliminates the need and expense of weekly inflation and prevents many tire injuries resulting from underinflation, the company says. Made of butyl rubber, which retains air to a much greater degree than any rubber yet found, the new tubes (left) are almost twice as thick as conventional tubes (right) and are available in three sizes, 7.00:15, 7.50:15 and 8.25:15. Barring injury to tire or tube, the new tubes will hold air pressures from 1 yr to 18 mo with only minor reductions, it is said. They are equipped with a special valve cap operated only with a special key to prevent unauthorized tampering.—B. F. Goodrich Co., Akron, Ohio.

slate, sulphur balls and gob to minus 8 or 6 in without oversize or choking up, regardless of the toughness of the feed, the maker says. In addition to its big advantage in savings in labor cost of pickers, the unit permits recovery by crushing and washing of coal formerly thrown away by pickers because of impurities, the company points out. Full details offered by American Pulverizer Co., 1119 Macklind Ave., St. Louis 10, Mo.



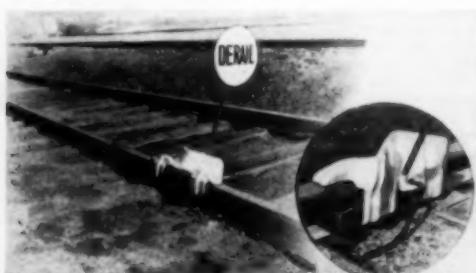
Factory-Built LP-Gas Engines for Trucks (3)

To permit truck operators to take advantage of large quantities of high-octane LP-gas (propane-butane) available and its potential savings in fuel costs, particularly in areas where cost per gallon is low, factory-built LP-gas engines are now optional as Underwriters Laboratories listed equipment on all International truck models equipped with heavy duty Super Red Diamond engines, the company has announced. Varied benefits in operating efficiency and lower costs are possible with the new units, which include the LP-185, LP-195 and LP-205 Roadliners and all models in the L-185 through LF-210 series, it is said. Large fuel tanks permit the trucks to run up to 400 mi between refuelings.—International Harvester Co., Motor Truck Div., Chicago 1.



Primary Crusher Handles Difficult Feed (2)

Designed as a primary crusher, the new American 30-S heavy duty crusher gives more efficient and lower-cost coal preparation through its ability to crush R-O-M coal, rock,



Portable Derail Needs No Spiking (4)

New Nolan portable derail unit for temporary derailing service and safety is recommended by the maker for wherever there is danger from wild cars, switching cars or unexpected car movements in rail yards, spurs, etc., and as particularly adaptable to mine use for protection at room necks, entries, etc. Derailment is accomplished in either direction, on left- or right-hand rail, and no spiking is necessary since wedge construction securely locks the derails to the rail, it is said. Full details and prices from The Nolan Co., Bowerston, Ohio.

Machine Bit for Severe Conditions



Recently-developed Kennametal UR Bits feature a thick narrow cutting edge to offer great resistance to impact, and meet more severe conditions. While originally designed for continuous mining machines, it has since been adapted with equal success for service in conventional chain machines. Tip thicknesses employed are $\frac{1}{4}$ ", $\frac{1}{2}$ ", and $\frac{3}{8}$ " depending on conditions. Kennametal Catalog Supplement B-73 gives full particulars.

New Roof Drill Bit Has Angled Slot

An improved feature of Kennametal Roof Bits, particularly for drilling hard materials such as laminated sandstone and other similar materials, is a slot recessed in the center of the insert at an angle of 30 degrees. This feature strengthens the cutting edges as backing is thus increased from 90 to 120 degrees. Operators have stated that it drills straighter, faster, lasts longer in hard materials.

Web Core Breakers in Coal Drill Bits

A special feature of Kennametal Drill Bits in larger sizes is a web core breaker. It is incorporated into the body design and extends from the center of the bit to the base of the cutting edge. Being offset it breaks up solids that may be formed between the prongs through both pressure and impact exerted on them by the core breaker while drilling. The web core breaker may be noted on the drill bit illustrated.

Dale Christopher to Represent Kennametal in Northern W. Va.



Dale Christopher has been recently named as representative for Kennametal tools in Northern West Virginia. Mr. Christopher has been associated with the

coal industry in one capacity or another for the past twenty years. His beginning with the Consolidation Coal Company of Kentucky has since led through various supervising positions, both in the mines and in the sale of coal mine equipment.

(Advertisement)

KENNAMETAL BIT...

drills long footage
fast and easy...
for
2 $\frac{5}{16}$ " diameter tubes



$1\frac{1}{2}$ " and $1\frac{1}{4}$ "
hexagonal
shanks permit
large size Ken-
nametal Bits to
be used either
with Kenname-
tal augers or
with augers of
other makes.

Solid tips of
Kennametal
tungsten-car-
bide offer prop-
er combination
of shock and
wear-resistance
to provide max-
imum service
life.

The rigid design of Kennametal Drill Bits enables them to give minimum bit cost and fast rates of penetration for drilling large diameter blast holes — especially for $2\frac{5}{16}$ " diameter tubes and for conditions requiring large mounted drills. Many thousand feet are obtained with Kennametal Bits while operating under excessive pressures in seams that contain many impurities.

The low cost of Kennametal Bit service is partly explained by husky body design and proper heat treatment, but more important is the superior shock and wear-resistant qualities of the Kennametal tip. In this important respect, no other tungsten-carbide in the coal industry can equal it.

For more particulars, inquire from your local Kennametal representative today! Kennametal Inc., Latrobe, Pa.

KENNAMETAL®



Quality Carbide Of The Coal Industry

**World's Largest Manufacturer of
Tungsten-Carbide Mining Tools**

DU PONT ANNOUNCES

an entirely new type blasting machine

GREATER CAPACITY

GREATER DEPENDABILITY

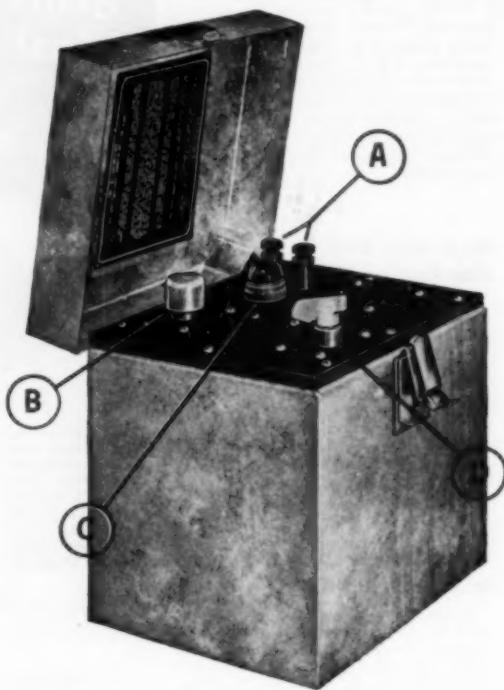
GREATER SAFETY

This latest product of Du Pont Explosives Research is a newly designed, portable, condenser discharge type blasting machine. In two models: CD-45 and CD-30.

Both machines have exceptionally high capacity. The larger (CD-45) is the most powerful built to date. Both machines easily fire small tunnel rounds in straight parallel... sizable rounds in straight series... and a surprisingly large number of caps in parallel series.

These new machines have been thoroughly tested in various kinds of operations throughout the country and have been found suitable for every conceivable type of blasting job, either on the surface or underground. The number of caps fired is not dependent on the physical effort applied by the operator, and the machines contain no moving parts.

Several built-in safety features provide maximum protection at all times. A group of long-lasting, radio-type B batteries are used to charge a number of condensers. At the moment of firing, these condensers deliver a powerful, instantaneous surge of power to the blasting circuit. The terminals are dead at all times except at the instant of firing and can never be made alive unless the operator has both hands on the controls and really means to fire the shot.



THEY'RE SIMPLE TO USE:

1. Connect wires to terminal posts "A" shown in photo above.
2. Depress charging switch "B" and hold until neon pilot light "C" shines brightly.
3. Still holding charging switch down... move firing switch "D" to "on" position. This action fires the charge. Terminals are energized only at the moment of firing... absolutely removing risk of a premature blast. It's as simple as that!



SPECIFICATIONS

The new Du Pont blasting machine is available in two compact models enclosed in rugged, waterproof, electroplated metal boxes:

MODELS

CAPACITY straight series

	primary blast	secondary blast	straight parallel	parallel series
CD-30 (small) wt. length 9 1/2 inches width 6 1/2 inches height 10 1/2 inches	50	125	25	480 (12 series of 40 each)
CD-45 (large) wt. length 11 inches width 9 1/2 inches height 11 1/2 inches	50	200	50	1200 (30 series of 40 each)

ASK THE Du Pont Explosives representative in your area for complete information about this new, safer, more dependable, high-capacity blasting machine. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

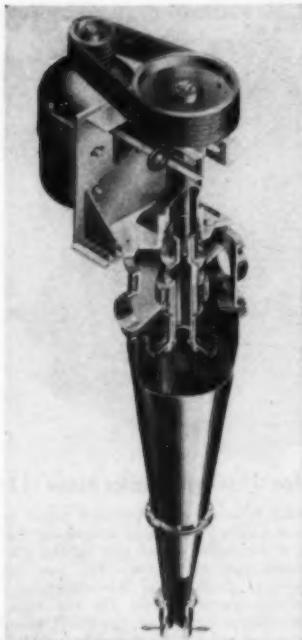
Blasting Supplies and Accessories



150th Anniversary

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

EQUIPMENT NEWS—For more information, use the card facing p 124.



Sharp Classification In Fine-Size Range (5)

New Centrifclone classifier, with operating characteristics of both the cyclone and centrifuge, is said by the maker to combine the independent variation of residence time and velocity attributed to a centrifuge with the tremendous shearing force of a cyclone. Overflow particles can be held to 5 microns in size and underflow solids thickened at 98% weight recovery. Sharp classification of very thick pulps in the 65- to 200-mesh range is a feature cited. The unit is

available in 10-, 20- and 30-in sizes with capacities of 30 to 100, 150 to 600 and 250 to 800 gpm, respectively.

Circle No. 5 on reply card for full details from Equipment Engineers, 41 Sutter St., San Francisco 4.



POWER ON
READY FOR TEST NO DEFECT
GOOD MATERIAL DEFECT INDICATED
FAULTY MATERIAL



Ultrasonic Tester Finds Internal Defects in Metals (6)

Ultrasonic "Reflectoscope," shown here testing power-shovel parts, is designed to reveal dangerous internal flaws or cracks in metals, ceramics or other material and is said to penetrate up to 30 ft of material. The unit produces ultrasonic pulses which are sent through the material, with an image appearing on its screen indicating whether a defect is present (as shown here). The Reflectoscope is used to check heavy machinery parts, large hoist shafts and other critical parts, either on the job or in the shop, and to test steel stock before use. Circle 6 on reply card facing p 124 for Bulletin 50-105 and other data from Sperry Products, Inc., Danbury, Conn.

with various tire sizes. Full information from Meili-Blumberg Corp., New Holstein, Wis.



Grader Features Selected to Fit Job (7)

New Model 42 single-drive and Model 44 tandem-drive motor graders are designed for medium-class ditch-to-ditch service and may be purchased with a wide range of equipment features to fit particular job requirements, with their price determined accordingly. The units are in the 40-hp class, weigh up to 15,000 lb, carry a 10- or 12-in blade and feature hydraulic control and five speeds forward and one reverse. They are available with gasoline or diesel power, with or without a power-circle turn, leaning front wheels, etc., and



Greater Efficiency for Large-Capacity Fans (8)

Scale-model tests of a new centrifugal fan wheel with airfoil blading demonstrated a 92% mechanical efficiency for airfoil blading, as compared with 84% for conventional-bladed fans, reports Westinghouse's Sturdevant Div. In addition, the

EQUIPMENT NEWS—For more information, use the card facing p 124.

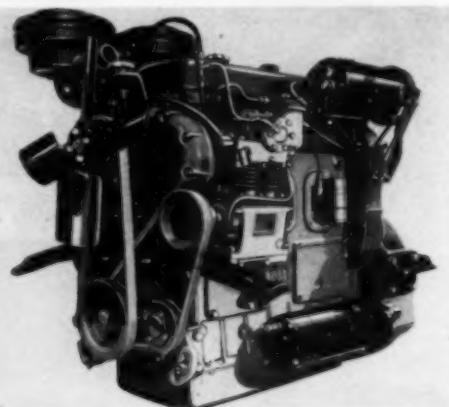
new fan is considerably quieter—developing 65% less noise energy than conventional types, it was said. Design is such that the blade exerts positive pressure on air over its entire face, resulting in a smooth air flow with a minimum of turbulence. The higher efficiency and savings in horsepower more than repay the small premium in first cost, it is said. Eight of the new-type fans will be used in a new station of the Consolidated Edison Co., each powered by a 1,250-hp Westinghouse motor.—Westinghouse Electric Co., Pittsburgh 30.



More Power for New Truck Line (9)

Five exclusive truck engines, most powerful in company history, drive the 275 power combinations in the new 1952 Ford truck line, which meets 97% of all modern "speed hauling" needs, the company reports. The three V-8 and two 6-cylinder units range from 101 to 155 hp, with torque from 185 to 284 lb-ft, wheelbases up to 195 in. and gross combination weight ratings up to 41,000 lb. Improvements and features exclusive with Ford include aluminum auto-thermic pistons, full-pressure lubrication, free-turn valves and the Ford Power Pilot carburetion-ignition system which gives the most power with the least gasoline consumption, the company says. Three of the power units are completely new overhead valve engines featuring high compression and low friction—the 101-hp "Cost Clipper Six," the "Cargo King" 145-hp V-8 and the "Cargo King" 155-hp V-8. More details

in Bulletin 7355 from the Ford Motor Co., Box 638, Dearborn, Mich.



Diesel Power for 2½-Ton Trucks Now (10)

Important new possibilities for diesel-powered trucks were indicated in the recent General Motors announcement that it was now marketing a 3-cylinder diesel unit in the 2½-ton classification—the lowest size yet offered. The new truck, rated at 110 hp, is being produced in five wheelbases, for either truck or highway-tractor models. On test runs, in comparison with a gasoline-powered unit, the diesel recorded 27% more miles per gallon and a 31% saving in fuel dollars, GM reports. Among the features cited by the maker for the new series is the exclusive GM 2-cycle design, direct fuel injection and fuel modulator which automatically proportions fuel and air for the most economical use in the lower speed ranges, eliminating lagging and the resultant severe bearing loads. The units are offered with a five-speed overdrive transmission and either single- or two-speed rear axle with 15,000-lb capacity. More data from *Truck & Coach Div., General Motors Corp., Detroit*.



Selenium Rectifier For 25-Hp Motors (11)

New selenium rectifier, operating from standard 3-phase AC power, provides 230 v DC for operation of motors up to 25 hp, energizing of electromagnets or other DC equipment. Among features cited by the maker are: long life, with no moving parts to wear, no

tubes or other perishable parts; overload and surge capacity up to 600% of normal rating; low standby-power consumption; high operating efficiency (about 80%); and instant operation, with no time-lag or warm-up period needed. The unit is self-contained in one pressed-steel cabinet 26x40x65 in and requires no external controls or panelboards. Other model also are available for loads from 3 to 50 hp from *Electronic Rectifier Co., Inc., Rochester 2, N. Y.*

Flexible Grease Lines For Belt Idlers (12)

An important basic improvement in belt-conveyor idlers designed to eliminate problems of broken grease lines is now standard on Rex roller bearing belt-conveyor idlers. Rigid steel grease piping has been replaced by reinforced flexible automotive-type grease tubing, which will take higher gun pressures and will not be broken off in shipment, the company says. The flexible sections are made so as to hug the inside of the inverted angle or channel base. Also, the new location of the grease fittings make them more accessible, permitting



safe servicing, as well as being protected during shipment by the idler base. More information from *Chain Belt Co., Milwaukee 4, Wis.*

Hoist Brakes Operated By Solenoids (13)

Brake assemblies for crane and hoist motors, solenoid-operated and furnished for AC or DC, feature anti-toeing retainers on the shoes, constant torque intensity regardless of lining wear, simple adjustment without feeler gages and small-diameter brake wheels as a result of abundant solenoid power, the maker says. The solenoids are provided with two shock absorbers, one to take up the impact of the plunger as the solenoid is excited to apply the brake and the other to take up the impact

Practical Assistance



Whether it's burrs in a dog's coat, or lubrication snarls in a mining operation . . . there's no substitute for practical assistance when the going gets tough.

And **PRACTICAL TECHNICAL ASSISTANCE** is a Cities Service specialty.

Cities Service Lubrication Engineers can offer every mining operation practical assistance that will mean dollars, man-hours and equipment saved. They're specialists in the industry's most effective lubricating practices. What's more, they offer the most complete line of quality lubricants.

BUT CHECK FOR YOURSELF:

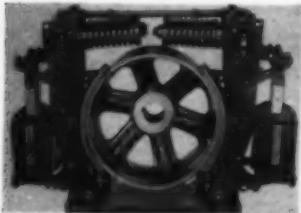
✓ Check on the high quality of all Cities Service lubricants. Ask your purchasing experts, or critical users. Or better still, test them on the job.

✓ Check the complete Cities Service Line for the correct lubricant for every need. Deliveries are sure, quick, accurate and dependable.

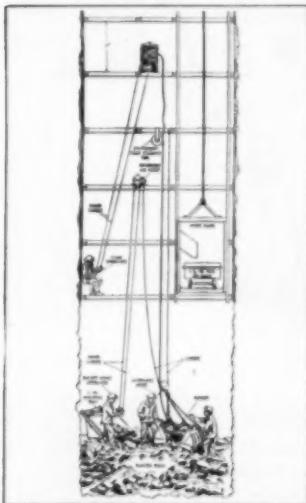
✓ And finally, discuss your problems with a Cities Service Lubrication Engineer . . . he's probably solved many like them for other mining operations. Write or phone CITIES SERVICE OIL COMPANY, Dept. C9, Sixty Wall Tower, New York City 5 . . . or get in touch with the office nearest you.

CITIES SERVICE

EQUIPMENT NEWS—For more information, use the card facing p 124.



generated by the springs as the solenoid is de-energized. Brakes are adjusted by tightening the torque tie bolt across the top of the unit and disconnecting the tie bolt permits both halves of the unit to fall away from the wheel for repairing either brake linings, shoes or the wheel. Torque settings are changed by turning four nuts on brake springs. Full details from *Trombetta Solenoid Corp.*, 329 N. Milwaukee St., Milwaukee, Wis.



Hand-Mucking Outmoded In Shaft-Sinking (14)

Shaft-sinking no longer need be slow or expensive with its newly improved Hydromucker, which reduces the need for fine fragmentation, cuts strenuous hand shoveling up to 99% and reduces necessary preparation time, according to Bucyrus-Erie. In operation, the hydraulically operated $\frac{1}{2}$ -yd clamshell bucket loads into a tray nearby. When the tray is filled, the hoist-operated lift rope is transferred from the Hydromucker to the loaded tray, which is dumped into a skip or car for hoisting to the surface. The bucket's hydraulic action provides ample closing pressure at the alloy-steel teeth and causes the bucket to bite down into the muck rather than drawing away as with rope-reeved buckets. On one job, cuts for blasting were deepened from 7 to 9 ft and output was

increased 35% with the Hydromucker and reduced hand labor, the company reports. Full data from *Bucyrus-Erie Co.*, South Milwaukee, Wis.



Lockerbaskets Hold Clothes Securely (15)

More efficient use of space, more light, better ventilation and economical installation are features of the Moore overhead lockerbasket cited by the maker. Of rust-resistant construction with 1,200 cu in of storage space, the basket will not tip and is designed for back-to-back suspension of garments to provide free air circulation and prevent contact

with adjoining clothes. The hooks are a part of the hanger itself and clothes on them cannot slip off or be knocked off since they are held by the weight of the basket which slides up and down. Installation plans and other details from the *Moore Co.*, 422 Professional Bldg., Charleston, W. Va.

Diesel-Engine Changes Boost Ratings (16)

Refinement of engine design of four Cummins diesel, with introduction of a full-flow lubrication system and continuous-groove main bearings on Models H-600, HR-600, HS-600 and HRS-600, have permitted an increase in continuous operating speeds from 1,600 to 1,800 rpm, and new ratings of 102, 115, 140 and 157 hp, respectively. The new ratings simplify application of Cummins diesels to many types of industrial applications, the company points out, since the engines may now be coupled directly to centrifugal pumps operating at 1,750 rpm as well as to generators operating at synchronous speeds of 1,800 rpm. Availability of the new horizontal 200-hp Model NHHB-600 Cummins diesels designed especially for city and intercity busses and rail-car applications also has been announced. The 6-cylinder full-diesel unit produces 200 hp at 2,100 rpm and a compression ratio of 15.5:1.—*Cummins Engine Co., Inc.*, Columbus, Ind.



Long-Hole Drill Tools (17)

For drilling long holes varying in depth from 20 to 150 ft, complete set of tools available for standard percussion-type rock drills include Tru-Seal shank, adapters, couplings, extension rod and Rok-Bit tungsten-carbide bits. Made for standard hole diameters of 1½ and 3 in, the line features couplings

and adapters built to be self-cooling and self-cleaning, with a tool designed to keep the hole in alignment and eliminate excessive vibration at maximum depth, the maker says. Where user has his own steel shop, sectional steel can be made on the job, the company points out. Bulletin from *Rock Bit Sales & Service Co.*, 2514 E. Cumberland St., Philadelphia 25.

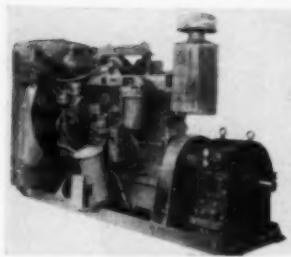


Mobile Tractor-Shovel With 1-Yd Bucket (18)

Newest addition to the Hough line of Payloader tractor-shovels is the Model HR equipped with a 1-cu yd bucket and with 60-hp diesel or 54-hp gasoline power optional. Similar to 1½-yd Model HM, the versatile unit is said by the

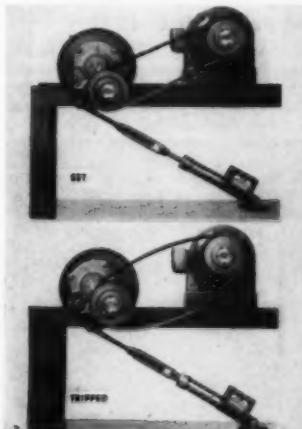
maker to feature large pneumatic tires and 4-wheel drive to give maximum traction and flotation; rear-wheel steer for easy operation and high maneuverability; four speeds in both directions; finger-tip hydraulic control of bucket; and a powerful automatic digging action independent of the unit's forward motion. Literature from *Frank G. Hough Co.*, Libertyville, Ill.

CARD USERS NOTE—Please be sure to give your name, position and company to insure proper handling of your request. Since some cards have been received without names, we would be glad to have you check us if you have no response to your request within a reasonable time.



Torque Converter Also Hydraulic Coupling (19)

Model 17-K single-stage three-element type unit newly added to the standard line of Torcon torque converters is said by the maker to combine a hydraulic torque converter and hydraulic coupling in a single unit and provide superior automatic transmission for shovels, cranes, road units and various other materials-handling machinery. It can be used with either gas or diesel engines rated up to 300 hp and is built for ease of installation and service. The Model 17-K has a variable torque ratio up to 3:1, and when the torque ration reaches 1:1, the reaction member is free-wheeled and the unit acts as a hydraulic coupling. In the coupling range, the output speed increases in nearly direct proportion to engine speed. Catalog offered by Torcon Corp., Ashtabula, Ohio.



Three-Way Protection For Speed Reducer (20)

New Dodge Tri-Matic overload release for Dodge Torque-Arm speed reducers is said by the maker to provide instant and positive protection for driven machines, motors and the speed reducer itself. Designed to prevent breakdowns and production interruptions and avoid expensive repairs, the release operates both mechanically and electrically to loosen the belts, cut off current and activate a warning bell, siren or light. The release acts instantly and positively.

Accurate screening

with BEE-ZEE screens

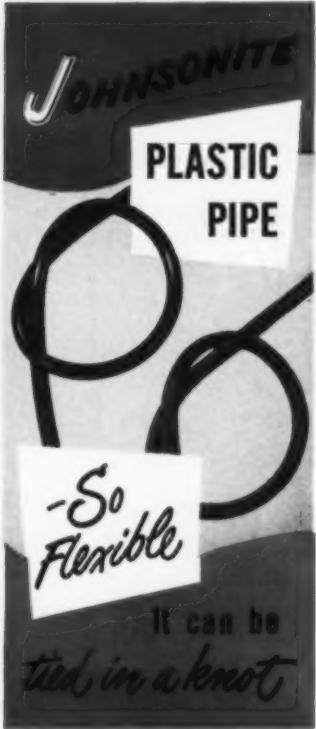
Whether your screening job is big or small, you'll find that BEE-ZEE's longer-life screening accuracy will save you money. The exclusive Bee-Zee Round Rod design maintains screening accuracy even with 50% wear...the reason why mine operators report that they last 10, 20, even 30 times longer, often easily cleaning and dewatering.

- ROUND ROD DESIGN MAINTAINS ACCURATE SCREENING
- Bee-Zee round top rods of stainless steel are accurately mounted by precision spot welding.
- Screen openings remain unchanged, despite gradual wearing down of top rod.
- Accurate screening even with top rod worn half-way through!

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Received by mail, it shows the Bixby-Zimmer catalog containing all the money-making features of Bee-Zee Round Rod Screens in mining operations.

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YES, and exhaustive tests prove it lasts over 30 years...here is the answer to your drainage problem.

Johnsonite is used in mines everywhere as a practical, proven product.

It's easy to install because it finds its own floor. It's 13 times lighter than ordinary pipe, making for ease in handling.

Corrosion-proof, acid-resistant, low in cost.

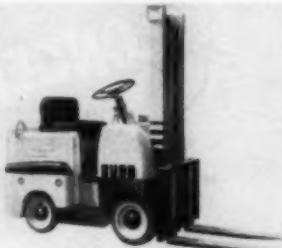
For complete information, contact your nearest distributor or write us direct.

JOHNSON

PLASTIC

BOX 268
CHAGRIN FALLS, OHIO

and is calibrated for adjustment to any desired load conditions, it is said. Available from distributors' stocks, the new unit replaces and is interchangeable with the standard torque-arm regularly furnished with the Dodge speed reducer. More details from Dodge Mfg. Co., Mishawaka, Ind.

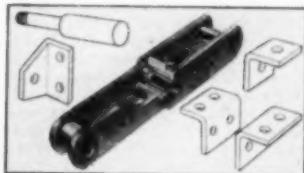


Diesel or Gasoline Power For Lift-Truck Line (21)

The Buda FT Series fork-lift trucks, completely new from the ground up and said to embody the latest in engineering, styling, accessibility and operating performance, is available in 12 models, with either a Buda diesel or Buda gasoline engine on solid or cushion tires in capacities from 3,000 to 7,500 lb. Design is strictly functional and engineered to meet strict requirements for safety, easy operation, long life, low-cost maintenance and "less-down-time" servicing, with over 85% of replaceable parts interchangeable between all 12 models, the maker says. Bulletin from The Buda Co., Harvey, Ill.



plied in all standard sizes from $\frac{1}{8}$ in. to 4 in. in four-point cross-type and two-point chisel-type bits. Design features cited by the maker include full body support of the carbide inserts for impact absorption; balanced airhole positioning for uniform high efficiency air pattern in blowing; and internal bit threading to prevent bottoming of steel and minimize thread wear and damage.—Brunner & Lay, Inc., Franklin Park, Ill.



Stock Conveyor Chain For Varied Use (24)

It is now possible to construct a wide variety of chain conveyors from stock with the introduction of Actmor Type HP (hollow pin) chain and attachments for all pitches available for either bolting or welding to the chain proper, the maker reports. Type HP chain is available for stocking in either a steel roller or bushing type in 2-, 2 $\frac{1}{2}$ -, 3- and 4-in. pitch, and on special order may be had in various strengths and pitches up to 12 in. Complete information from Conveyor Chain Co., Bedford, Ohio.



New Flexible Hose Has Light Weight (22)

Newly developed Flexast hose, made with neoprene compounds and laminated nylon chafer duck, is light in weight and extremely flexible, the maker reports. For both pressure and vacuum service, the wire-reinforced Flexast has been designed for operations involving abrasive-dust collection, heavy flexing, gravity feeds, etc., and is available in sizes from $\frac{1}{8}$ to 24 in. inside diameters. Full details from American Ventilating Hose Co., 100 Park Ave., New York 17.

Tungsten-Carbide Bits (23)

New complete line of Brunner & Lay Rok-Bits for use on wagon drills, jackhammers, stoppers and drifters are sup-



Plastic Lens Half the Weight of Glass (25)

New AO plastic safety lenses, said by the maker to be half the weight of glass and extraordinarily resistant to breakage,

are produced in a specially designed airconditioned room built to eliminate dirt that often affects appearance and quality of plastic lenses. A culmination of 5-yr research, the setup, combined with a new chemical formula and new manufacturing techniques, produces eye savers that are optically perfect, clear as crystal, exceptionally tough and comfortable to wear, the company says. They are recommended for varied eye hazards. Full details from American Optical Co., Southbridge, Mass.

Equipment Shorts



(26) "QUICK CONNECTORS" of a new type for various use with wire rope, rope or chain are instantly joined or detached by a turn of the fingers, but offer a high safety factor since once joined they can't come apart until intentionally disconnected, the maker says. The hooks are made in various sizes and types from corrosion-resistant manganese bronze, with "featherlight" units from aluminum-base "Ternalloy" also.—Full details from Brummel Hook Co., Chicago 40.



(27) pH METER, the new battery-operated Model N weighs only 8 lb complete and can be used either vertically or horizontally. It covers the entire pH range from 0 to 14, with high accuracy and low operating cost, the maker says. Beckman Instruments, Inc., South Pasadena, Calif.

(28) HIGH - CURRENT VOLT - AMMETER, the Amprobe Model 1200, measures up to 1,200 amp but weighs only 15% oz and can be carried in the coat pocket, the maker points out. It is

EXPERIENCE QUALITY SERVICE

- Poured in our own foundry from the finest ingots, West Virginia CUSTOM-MADE bronze linings and bronze gears are unexcelled in wearing qualities, workmanship, and fit.

Cast by molders who think first of quality and machined in a modern shop by top-notch workmen, West Virginia CUSTOM-MADE bronze linings and gears will give the coal operator the most for his money.

Journal and axle linings are available for all types of haulage motors and bronze gears can be furnished for all types of mining machines. Try them.

Manufacturers of:

ARMATURE COILS—FIELD COILS
BRASSES—JOURNAL BOXES
REPLACEMENT PARTS FOR MINING
MACHINERY AND LOCOMOTIVES



WEST VIRGINIA ARMATURE CO.

Bluefield & Williamson
WEST VIRGINIA

MCDOWELL ARMATURE & MACHINE WORKS, WELCH, WEST VA.
MINE SUPPLIES, INC., MONTGOMERY, WEST VA.
AMERICAN ARMATURE & ENGINEERING CO., MULLENS, WEST VA.
KENTUCKY-WEST VIRGINIA ARMATURE CO., WHITESBURG, KY.
CENTRAL ELECTRIC REPAIR CO., FAIRMONT, WEST VA.
SERVICE MACHINE & ELECTRIC CO., GRUNDY, VA.

Hazleton

TYPE "TS" PUMPS

- "Hazleton" "Kleerseal"® stuffing boxes provide a dependable yet simple seal. No messy floor from leaky seals during idle periods.
- Shaft sleeve can be renewed from impeller end.
- Renewable wearing plate, casing ring and impeller ring.
- Impeller ring clearance readily adjustable for wear. Pump thus retains original capacity until parts are completely worn out.
- High efficiency pumping reduces cost of operation and initial cost since smaller motor and drive can be used.
- Wear resistant alloys used on all internal parts.

"Kleerseal" is a Trademark of
Barrett, Haentjens & Co.

FOR
HEAVY-MEDIA

American Cyanamid Company has received reports of satisfactory performance of the type "TS" Pump under operating conditions in Heavy-Media separation plants and is pleased to add this pump to their list of suggested equipment for this service.

BARRETT, HAENTJENS & CO. HAZLETON, PENNA.

PITTSBURGH, PA. • HUNTINGTON, W. VA. • PHOENIX, ARIZONA • BIRMINGHAM, ALA. • ISHPeming, MICH.

*Four "HAZLETON" Type "TS" Pumps at Indian Head Coal Company on the Heavy-Media System. This installation was designed by H. J. Daniels & Co.

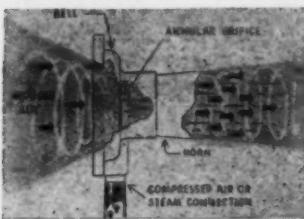
The high efficiency and simplicity of the "HAZLETON" Type "TS" pump lead to its adoption as standard equipment by several manufacturers of Heavy-Media preparation equipment.

USE THIS CARD

of the snap-around type, which instantly measures current without connection to the conductor and permits readings without interrupting the circuit or shutting down equipment.—Data from *Pyramid Instrument Co., Lynbrook, N.Y.*

(29) **ALL-PURPOSE WORK GLOVE** with a special coating that sheds moisture and resists chemicals better than rubber is said by the maker to wear like leather yet cost little more than ordinary canvas gloves. The vinyl-plastic coating stays flexible in extreme cold, does not become tacky at high temperatures and is effective against strong acid concentrations. Bulletin CF-30 from *Mine Safety Appliances Co., Pittsburgh*.

(30) **SPARE PARTS KITS** for Westinghouse Life-Linestarters are designed to ease the problem of stocking normal wearing parts. Containing replacement moving contacts, moving contact springs, and stationary contacts, the six different kits cover 2- and 3-pole starters in Sizes No. N1 and N2, and in combination can be used for 4- and 5-pole starters.—*Westinghouse Electric Corp., Pittsburgh*.



(31) **LARGE VOLUMES OF AIR** can be moved rapidly and economically in confined and other areas requiring intermittent or emergency ventilation with the M.S.A.-Lamb air mover, the maker says. The portable lightweight horn-shaped device without moving parts uses compressed air or steam to move air as either a blower or exhaust. It is made in three sizes, with the largest weighing only 47 lb and handling 5,100 cfm at 50-lb line pressure. Bulletin DP-5 with full data from *Mine Safety Appliances Co., Pittsburgh*.



(32) **NEW ELECTRIC INSULATION** that can't be harmed by a blowtorch, G-E micmat consists of minute mica

YES—I would like more information . . .

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (March 1952)

1	5	9	13	17	21	25	29	33	37	41	45	49	53
2	6	10	14	18	22	26	30	34	38	42	46	50	54
3	7	11	15	19	23	27	31	35	39	43	47	51	
4	8	12	16	20	24	28	32	36	40	44	48	52	

In addition, please send me data on these OTHER products advertised in this issue (give name and page number) . . .

Name (Print) Position

Company

Address

NOT GOOD if mailed after May 1, 1952

flakes held together by a special treatment and produced in a continuous sheet. Providing outstanding insulation resistance, even with American mica of inferior quality, the new product will eliminate dependence on foreign sources of mica, it is said. Production is scheduled for this spring and new laminates, tapes, and molded shapes are expected in the near future.—*General Electric Co., Chemical Div., Pittsfield, Mass.*

(33) **DOUBLE ROLL CRUSHER** with peripheral sizing pockets in each roll recently patented by T. J. Gundlach reportedly offers high efficiency. In tests on Illinois coal with the crusher set for $\frac{3}{4}$ -in top size, only 4% of the coal exceeded $\frac{3}{4}$ in, all passed through a $\frac{3}{8}$ -in screen and less than $\frac{7}{8}$ went through a 10-mesh screen, the company reports.—*T. J. Gundlach Machine Co., Belleville, Ill.*

EQUIPMENT BULLETINS AVAILABLE

(34) **ELECTRIC CABLE**—Cornish Wire Co. has announced that the USBM and the Pennsylvania Department of Mines have registered its Type SO "Corprene" jacketed cord as having successfully passed their flammability tests. Full data on this flame-proof cable, identified in sizes of 14 gage and larger as P-117BM, is available from *Cornish Wire Co., 50 Church St., New York 7*.

(35) **KEY-OPERATED CYLINDER LOCKS** for Westinghouse oil-tight push-buttons come in two basic types, with several models covering virtually all possible conditions. The selector-switch type has two or three rotary positions, while the pushbutton type can be depressed in either full or intermediate positions.—*Westinghouse Electric Corp., Pittsburgh*.

(36) **ELECTRICAL WIRE AND CABLES** for coal mining are thoroughly covered in a new 52-p engineering catalog published by the United States Rubber Co., Rockefeller Center, New York 20. The booklet includes complete performance and specification data on insulation and jacket compounds, portable cords and cables with a voltage rating up to 5,000 v, along with complete data on shielded portable cables, welding cables, borehole cables, mine power cables and miscellaneous mine equipment such as blasting wires, miner's lamp cord and telephone cable. Engineering data on splicing and patching, current-carrying capacities, conductor-resistance temperature-correction factors

and formulas for determining amperes are also incorporated.

(37) **COAL-REDUCTION EQUIPMENT**—New Bulletin 1151, covering Eagle coal-reduction equipment, describes Eagle double-roll coal Crackers and stoker coal Chippers for small mines, power plants and coal yards. Auxiliary equipment includes stationary "Packaged" units with integral motor mount, flared hoppers for conveyor set-ups and wheel mounting for portability of chipper and crackers. *Eagle Iron Works, 129 Holcomb Ave., Des Moines, Iowa.*

(38) **CONDUIT-PRODUCTS SELECTOR**, available from General Electric's Construction Materials Div., Bridgeport 2, Conn., is designed to aid the electrical engineer, electrician and maintenance man to compute the allowable conduit fill for various-sized rubber, thermoplastic or lead-covered conductors by a simple dialling operation. The reverse side of the selector uses the same technique to figure number of conductors allowed in the most commonly used outlet, switch and utility boxes. All tables used in the selector are from the 1951 National Electrical Code.

(39) **CABLE-REEL SHUTTLE CARS**, the Jeffrey class 66 units available in heights ranging from 30 to 48 in with capacities up to 6.1 tons, are covered in Catalog S40 available from the Jeffrey Mfg. Co., Columbus 16, Ohio. Construction and operating features, with dimension drawings and specifications,

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THE EDITOR, COAL AGE

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are included along with data on the Jeffrey Type 72-Al elevating conveyor.

(40) OSCILLATING CONVEYORS—New 24-p illustrated Book 2444 on Positive Action oscillating conveyors for conveying, feeding, cooling and screening various loose bulk materials, is offered by Link-Belt Co., Chicago 1. Included are dimensions, weights, capacity and horsepower charts on Torsion Mount oscillators for heavy duty, as well as for the recently announced Flexmount Oscillator for lighter-duty applications. Trough widths of standard conveyors range from 8 to 48 in., with handling capacities ranging to several hundred tons per hour.

(41) TOTALLY - ENCLOSED FAN-COOLED MOTORS with tube-type air-to-air heat exchangers in ratings from 40 hp at 600 rpm through 800 hp at 3,600 rpm are described, in new Bulletin 51B7149B released by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Full details of construction features, operation and performance are provided on the motors, which are available in standard and explosionproof designs.

(42) VARIOUS BLENDING METHODS are discussed in Bulletin 152 recently issued by The Robins Engineers Div., Hewitt-Robins Inc., 370 Lexington Ave., New York 17. The 16-p illustrated booklet supplies a thorough exploration of blending, covering such subjects as: what is blending and its advantages; principles of blending, mixing, proportioning, etc.; plus a comparison of methods, in which bin blending is described and contrasted with the Hewitt-Robins blending system as performed with such equipment as an ore reclaimer, a coal or digging reclaimer.

(43) AUTOMATIC WEIGHING—Bulletin 851 from the Merrick Scale Mfg. Co., Passaic, N. J., details the various applications and features of the Merrick "Weightometer," which automatically weighs in transit material carried on belt conveyors, as well as the "Feedoweight," which is said to feed, weigh and proportion by weight. Diagrammatic drawings of various installations are included.

(44) FUEL SAVINGS of Cummins diesels over gasoline engines can be easily calculated in dollars on a cost comparator prepared by Cummins Engine Co., Inc., Columbus, Ind. This handy slide-rule-type calculator permits power users to quickly determine yearly savings possible with use of Cummins diesels for all types of applications. For the truck owner, one scale is on a mileage basis. The reverse side of the slide-rule shows savings on an hourly basis for industrial users.

(45) ROTARY DRIERS—32-p. Bulletin 16-D from the Hardinge Co., Inc., York, Pa., offers full data on design and operating features of the Ruggies-Coles rotary dryers available in seven distinct types, kilns, coolers, cyclone dust collectors and Hardinge regulating feeders. Flowsheets illustrating typical applications are included.

(46) MATERIALS - HANDLING AND PROCESSING EQUIPMENT in the multi-product line of the Pettibone-Mulliken Corp. and its subsidiaries are illustrated and briefly described in new 36-p booklet available from the company at 4700 W. Division St., Chicago 51. Included are various loaders, graders, buckets, crushers and portable crushing plants, etc., made by Pettibone-Mulliken, George Haiss Mfg. Co., Inc., Universal Engineering Corp. and Hammermills, Inc.

(47) HOW PRODUCTION of 30 million diesel horsepower by a single manufacturer can be regarded as an owner's insurance policy to assure top engine performance is told in a booklet just published by the Detroit Diesel Engine Div., General Motors Corp., Detroit 28. The booklet covers various design features of the GM-2-cycle diesel engine, photographs of varied installations and a map showing the division's sales and service facilities throughout the country.

(48) STANDBY EMERGENCY POWER is featured in "E-M Synchronizer" No. 35, quarterly publication of the Electric Machinery Mfg. Co., Minneapolis 13, Minn., with an article written by E. W. Kammerer, E-M switchgear, engi-

neer, which deals with requirements of standby power, types of service available and a detailed discussion of controls for automatic start-stop operation. Other articles include a "Handy Selection Index for Engine-Driven AC Generators" and a description of "Walkway"-type generator switchgear.

(49) V-BELTS—Newly improved Manhattan single-groove V-belts are described in Bulletin 6830B issued by Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J. According to the maker, Manhattan FHP belts embody an advanced design with straight sidewalls for more grip and with cords in the strength member held in a straight "power line" by a special "truss ply" of finely woven duck under the top cover, which is said to increase life of belt and driven machine by eliminating vibration.

(50) FUSES AND OILERS—Folder, Series F.L.B. 300-C, describing Trico electrical and lubricating products, covers Trico Powder-Packed renewable, one-time and plug fuses, fuse pullers, "Kliplok" clamps for fuse clips, "Kliplok" test clamps and automatic lubricating devices. Handy wall chart shows various types and sizes of lubricating devices, together with suggestions for proper selection and application. Trico Fuse Mfg. Co., Milwaukee 12.

(51) CONVEYOR AND ELEVATOR BELTING—Catalog provides necessary data to lay out a drive or specify a belt, with complete tables on carrying capacities, horsepower factors, pulley diameters, maximum and minimum piles for proper troughing and other engineering information. Available from New York Belting & Packing Co., 1230 Avenue of the Americas, New York 20.

(52) PROTECTIVE COATINGS—Bulletins N-1, N-2 and N-3, provide detailed data on various types of Gaco neoprene liquid lining designed to cut maintenance costs by providing lasting protection against corrosion and abrasion on a wide range of equipment and industrial applications. The folders are available from the mining distributor, the Crichton Co., Equipment Div., Johnstown, Pa.

(53) PIPE TOOLS—New 1952 Beaver catalog gives pertinent data on the three pipe and bolt machines, ratchet threaders, reamers, cutters and other pipe tools in the hand and power classification. Included is the instructive "Operating Guide" designed to help users locate and correct pipe tool troubles, clarifying 31 different operations. Offered by Beaver Pipe Tools, Inc., Warren, Ohio.

(54) REFRACTORIES—New 12-p booklet, "Hydraulic Setting Refactories," presents the five different J-M Firecrete products for casting special refractory shapes and the three J-M Blazecrete products for gunning and slab troweling applications, for services through 3,000 F. The brochure, containing suggestions for solving maintenance problems as well as recommendations for casting shapes and linings, is available from Johns-Manville, 22 E. 40 St., New York 16.

FOLLOW THE LEADERS IN LOW-COST BELT HAULAGE

This partial listing of producers using B-G Belt Conveyors—both above and under ground—should be of interest to anyone who wants to mine more tons per man-hour with lower operating and maintenance costs.

For over twenty years Barber-Greene Mine Conveyors have been identified with profitable mining operations. Specifically designed for mining service, they offer the added benefits

of Barber-Greene "standardized" construction. Made up of standard packaged units—truss sections, drives, take-ups, frames, etc.—they are easily assembled, dismantled and relocated with 100% salvage—desirable features in any fast-moving mining operation.

For comprehensive information on why the leading producers choose Barber-Greene Conveyors, write for bulletin 676-A.

PARTIAL LIST OF B-G MINE CONVEYOR OWNERS:



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Peters Creek Coal Company
Cannelton Coal and Coke Company
The Hatfield-Campbell
Creek Coal Company
The Carbon Fuel Company
Stonega Coke and Coal Company,
Inc.
The Warner Collieries Company
Inland Steel Company
Chicago, Wilmington & Franklin
Coal Co.
The Spruce River Coal Company

Bell & Zoller Coal and Mining Co.
Pond Creek Pocahontas Company
The Youngstown Sheet and Tube Co.
Clayton Coal Company
Seano Mining Company
Pittsburgh Coal Company
Boone County Coal Corporation
Susquehanna Collieries Co.
Enterprise Coal Mining Co., Inc.
Johnstown Coal and Coke Company
Lake Superior Coal Company
Dawson Collieries

Blue Bird Coal Co.
Algoma Steel Corp., Ltd.
Landisburg Coal Co., Inc.
Carbonizing Coal Co.
Kirk Coal Mining Co.
Ashland Coal and Coke Co.
Pinnacle Coal Corporation
Turkey Gap Coal & Coke Co.
Alta Coal Division
Mary Frances Coal Co.
Atlas—P. & K. Coal Co.
South-East Coal Company
Boyles Coal & Supply Company

Barber-Greene

AURORA, ILLINOIS

POINTING the WAY

To Continuing Prosperity

The set of figures in the middle of this page is news of high importance to every American.

In effect, it says that there is no basis in fact for all this talk about a collapse of capital expenditures plunging us into a depression following the industrial build-up for defense.

Such talk assumes that without defense orders business would spend relatively little for new industrial plant and equipment. The figures below show that that assumption is not justified.

penditures in 1953, 1954 and 1955, provided the money to carry them out can be obtained.

A Record in '52

As was expected, their plans call for another record-breaking volume of capital expenditures by business in 1952. But, as many did not expect, the McGraw-Hill survey also discloses plans for very heavy capital expenditures in each of the three years following. Expenditures now planned for those years are, to be sure, lower than those planned for 1952. But the significant fact is not that

BUSINESS PLANS FOR NEW PLANTS AND EQUIPMENT (Millions of Dollars)

	Actual Spending 1950*	Actual Spending 1951*	McGraw-Hill Survey			
			Planned	Preliminary Plans —		
				1952	1953	1954
Manufacturing	7,491	11,141	12,921	10,028	8,525	8,194
Mining	684	806	943	415	321	358
Railroads	1,136	1,564	1,642	1,248	1,117	1,002
Electric & Gas Utilities**	3,298	3,676	3,948	3,360	3,204	2,748
Other Transportation & Communications	1,392	1,592	1,721	1,671	1,943	1,839
ALL INDUSTRY	14,001	18,779	21,175	16,722	15,110	14,141

*U. S. Department of Commerce

**Electrical World (A McGraw-Hill publication) and American Gas Association.

The figures come from the fifth annual McGraw-Hill survey of business plans for new plant and equipment. Companies were asked to report through that survey not only their plans for 1952, but plans they now have in hand for capital ex-

penditures in 1953, 1954 and 1955, provided the money to carry them out can be obtained.

The significant fact is that the expenditures already planned for 1953-55 are so high. For example,

those now planned for 1955 would be higher than those of 1950, which, at that time, were second highest in our history.

If these plans are carried out we shall have an essential element of continuing prosperity. Sustained expenditures for capital expansion and betterment account directly for a large share of our employment and consumer income. Moreover, consistent modernization of industrial plant raises production efficiency and brings more and better goods and services within reach of more consumers.

It is not to be expected, of course, that we can come down from the peak of the defense boom without readjustments in some sectors of business. But if capital expenditures by business are carried out on the scale now planned, we shall be able to take any necessary readjustments in our stride, and continue to increase our industrial strength.

From V-J Day to the end of this year, manufacturing industries will have spent over \$60 billion for new industrial plant and equipment. This is more than the value of all the plant and equipment these industries had on their books at the end of World War II. It is this heavy outlay that causes some, assuming most postwar plans for industrial expansion and modernization will be completed, to fear a collapse of capital expenditure.

Plans to Go Ahead

But American industry still has plans to go right ahead expanding and improving its facilities. This was the most striking single finding of this year's survey.* It disclosed also that after 1952:

— 83 per cent of the companies answering the survey are planning substantial further modernization.

— 48 per cent will need more capacity to make their present products.

— 33 per cent plan additional capacity to make new products.

It cannot be too strongly emphasized, however, that these plans represent what American industry wants to do. They are a concrete expression of hope and aspiration. As such they are extremely important, for they dispose of the idea that business considers the job of expanding and improving its facilities as finished, or anywhere near finished.

But the plans carry no guarantee of accomplishment. If they are to be realized, business must have

the funds to carry them out. There is no assurance that the money will be available if the present level of corporation taxes is continued. Eight out of ten companies, according to the McGraw-Hill survey, will rely entirely on profits and reserves to finance their 1953-55 programs. So, in calculating their programs for these years, the companies were asked to assume relief from "excess profits" taxation.

Federal taxes now take at least 52 per cent of a corporation's profits, and 82 per cent of any profits in the so-called "excess profits" bracket. Despite this drain on their funds, companies are able to finance their 1952 programs because (1) they are borrowing heavily, and (2) many of them are getting government loans or special tax concessions on new facilities installed for defense purposes. But these are emergency aids.

Only Two Ways

When the present defense program tapers off, there will be only two ways by which business can possibly increase its principal source of funds for new plant and equipment. One way is to make more profits before the tax collector takes his cut. And the only way many companies, already operating at capacity and high efficiency, can do that quickly is by raising their prices. That is an unpopular method. Also, with the return to more competitive markets, it might be self-defeating.

The other way is for the federal government to release its strangle hold on business profits. The so-called "excess profits" tax—the 82 per cent tax which is really a tax on business growth—should be repealed, effective January 1, 1953. And a cut in the basic tax of 52 per cent on all corporate profits should come not much later. That is by all odds the most important single step toward assuring that business plans already made for capital investment in 1953, 1954 and 1955 are carried out. It is the most important single step toward sustaining our present prosperity.

Through its plans for continued expansion and improvement of its facilities, American business clearly points the way to avoid the depression that so many have feared—and the Communists have so ardently hoped—would follow the peak of defense mobilization. It will be a tragedy for our country and for Americans in every walk of life if we do not insist that business get the chance to follow this wise and constructive course.

McGraw-Hill Publishing Company, Inc.

*Note—A copy of the full report of this survey can be obtained by addressing: Department of Economics, McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York 36, N. Y.



EQUIPMENT BETTER PROTECTED AT LESS COST

**Sun Mine Grease Again Proves Its Superiority,
Keeps Loaders Working—Builds Up the Profits**

This loader, one of 36 in a western Pennsylvania mine, can fill a 5-ton car in a couple of minutes. That's action, and it takes more than an ordinary grease to protect the bearings and drives.

At first the mine used a product that formed gummy deposits in the bearing-grease reservoir. This kept fresh grease from reaching the bearings and caused excessive wear. Subsequently other products were

tried out—with somewhat better results. But in every case the price was higher than good business-judgment could approve.

Next the mine turned to a "Job Proved" Sun mine grease, known to many producers for its performance plus economy. In over 18 months there has not been a single breakdown due to lubrication, even with the equipment occasionally overloaded. Much of the time the

loaders run at top capacity. Output is high—and profitable. Grease costs are low.

There are "Job Proved" Sun mine oils and greases for every lubrication need, whether in producing, transporting, or processing.

Wherever used, these products are contributing to economical operations. Call in your nearest Sun Industrial Products man for consultation on your problems.

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NEWS Round-Up

Mine Safety the Key Question

HOW TO MAKE MINES SAFER continued to hold the spotlight in February as the industry's most pressing problem.

With Congressional hearings in Washington setting the stage, the controversy was embroiling top government officials, mine-operating men, federal and state mine departments and the UMWA in a welter of charges and counter-charges, opinions and proposals.

Ending Jan. 30 of the Senate Subcommittee hearings on the Neely Bill to give the Bureau of Mines power to close mines was followed Feb. 18 by the opening of hearings on similar bills before a Subcommittee of the House Committee on Education and Labor. In Illinois, a legislative commission was conducting an investigation into the Orient No. 2 disaster, while new mining codes were under consideration in Kentucky and Virginia. In Pennsylvania and West Virginia, the state mine departments were vigorously attacked by the UMWA.

Carpentertown Blast Kills Six

Demands for federal police power over coal mines were further intensified by an

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explosion Feb. 2 that killed six men in the Carpentertown No. 2 mine of the Carpentertown Coal & Coke Co., near Greensburg, Pa. During preliminary investigation at the scene, Richard Maize, Pennsylvania Secretary of Mines, said that methane apparently was the cause of the blast although none had been found in the mine for 10 yr. Immediate contradiction came from Secretary of the Interior Chapman in Washington, who reported that federal inspectors had found "gassy

conditions" and "serious hazards" in the mine last fall. Mr. Chapman cited the accident as another example of the "urgent need for revision of the federal mine safety laws."

The UMWA, in a statement, said that the explosion was a result of methane gas and the use of non-permissible equipment and "is just one more example of the need for strong federal mine safety legislation." C. Baton, president and general manager of the company, denied that there was non-permissible equipment in the mine and said that federal men had inspected the mine for 6 days in November and had found no methane. The state department and an independent engineer inspecting the mine in November and December also had not found methane, he said. The possibility that a natural gas well had been cut into also was advanced in some quarters.

According to the report of the USBM investigation released Feb. 13, the Carpentertown explosion was caused by ignition of a body of gas in a "supposedly nongassy mine" ignited by an arc or spark from a trolley locomotive. Noting that the mine was classified as nongassy by the Pennsylvania Department of Mines and operated as such, the report states that the mine was considered gassy by the Bureau, under the provisions of the Federal Safety Code, because 0.25% methane had been found by chemical analysis in an air sample collected by a federal inspector in June, 1951. Of 63 air samples collected during 14 federal inspections and a special gas survey last September, 21 samples contained methane in varying amounts up to 0.25%, it noted. As conditions responsible for the disaster, the Bureau listed: "an inadequate ventilating system" in which air from abandoned and pillar workings was coured to active workings and to haulage roads; and operation of open-type pumps and locomotives in air returning from abandoned workings and pillar workings.

One Large Operator Group Favors Limited Police Power

Of considerable interest in the Senate hearings on the Neely bill was the proposal advanced by a group of operators representing more than one-fifth of the bituminous tonnage that the USBM be given enforcement powers, but with certain definite limitations. This proposal was made by Ed Schorr, Ohio attorney, representing the Ohio Coal Association, Cen-

You Can Take Your Pick of These . . .

"Full Dress" Wage Talks . . . Or Wage Hike Sans Fuss

No quiet, courteous wage talks this year but a "full dress" affair with possibly stormy headlines.

That's one slant going the rounds in Washington these days. Circles close to but not affiliated with Mr. Lewis' UMWA back up their prediction thus:

1. In the safety issue, Mr. Lewis has a dramatic bargaining lever to turn public sympathy in his favor.

2. District officials who fought the union's early battles side by side with Mr. Lewis are aging and passing off the stage. Younger men, as yet unblended in the heat of conflict, must learn how to get tough at the bargaining table. The upcoming wage talks will give Mr. Lewis a chance to discipline them and to whip some mavericks back into line.

But there's another way to figure it, other reports from Washington say. These sources feel that, once the steel question is settled, Mr. Lewis and the Northern operators will move quickly to put through a wage boost at least equal to, if not more than, that obtained by the steelworkers, effective April 1.

While the wage agreement is still operative until cancelled on 60-day notice by either party—and notice had not been given up to late February—higher wages can still be put into effect, if both sides are willing. The Southern group may balk and stand on its legal rights to a 60-day notice, these reports say, but is expected to go along on the deal in the end.

So there you have it. Mr. Lewis, as usual, is the key man.

Orient No. 2--Whom Miners Blame

Coal miners at West Frankfort don't agree on who was to blame for the disaster that took 119 lives Dec. 21.

Their mixed-up thoughts came to light when *Coal Age* asked a newspaperman in West Frankfort to quiz 10 rank and file workers on their thoughts about the explosion.

The question was:

Who do you think was responsible for the New Orient explosion?

Five employees of Chicago, Wilmington & Franklin Coal Co. answered the question. Here's what they said:

1. "I believe the management was responsible. I think the company officials knew there was a hazardous condition and did not take the necessary precautions. Watchmen should be stationed at gaseous places 24 hr a day."

2. "The safety-first men. They should go into the mine before the men report for work and examine continually during the shift."

3. "The face boss who was on duty in the section of the mine in which the explosion occurred and the safety-first man in that area. There was also a big responsibility on the men. The men should never leave trap doors open or smoke in the mine."

4. "Directly, the management was responsible, since it is in the power of the company to manage the mine. Indirectly, the union and the men were responsible to a certain extent by failing to force the management to do what they knew should have been done."

Central Pennsylvania Coal Producers' Association, Western Pennsylvania Coal Operators' Association, Northern West Virginia Coal Association, Northern Panhandle of West Virginia Coal Operators' Association and several other operators not members of those groups.

His group had concluded that compulsory enforcement by the Bureau is necessary. Mr. Schorr said, but it feels that every detail should be written into the statute so that the Bureau would be acting under law and not under arbitrary rules. A it stands, the Neely bill would give the Bureau arbitrary authority to impose on the industry any regulations and rules it sees fit, with the result that a few Bureau officials, with or without mining experience, would have unlimited and indefinite control over all phases of America's most basic industry, he pointed out.

The Senate hearing had opened Jan. 24 with a statement by Secretary of the Interior Chapman read in his absence by Robert Rose, assistant secretary (see p 70). Others appearing before the group included: John J. Forbes, USBM director;

5. "The mine management and improper inspection were responsible. Gas from the old works was not properly disposed of."

Five miners not working for Chicago, Wilmington & Franklin gave the following answers:

1. "The method on which the mine was developed and the system of ventilation in use were, in my opinion, responsible."

2. "The mine management. Management is too negligent about correcting unsafe conditions. The cost of complying with safety recommendations often enters into delay in doing the things that are necessary."

3. "The management was partially responsible. The inspectors were also partly responsible by not insisting upon compliance with their recommendations."

4. "I believe the company was at fault. The company knew gas was present and should have taken steps to prevent it. Places where gas was present should have been ventilated and a 24-hr watch should have been maintained in gaseous portions of the mine."

5. "I believe that any catastrophe of this kind is as much the responsibility of one individual as another. They must rely upon each other. One careless person endangers all. A man who disregards his own safety in the mine disregards the safety of all others."

To find out the latest on the safety controversy, turn back to the special feature article beginning on p 70.

John L. Lewis; R. E. L. Hall, NCA council; Walter R. Thurmond, Southern Coal Producers' Association; Walter Eadie, Richard Maize and Arch J. Alexander, state mine chiefs in Illinois, Pennsylvania and West Virginia, respectively. Full approval of the Neely Bill expressed by the government and UMWA officials was, in general, opposed by the state and operator representatives. Secretary Chapman also opened the House hearing Feb. 18 with a statement calling for federal enforcement power.

Opposition to bills giving police power to the Bureau was strongly expressed by George Baima, president of the Progressive Mine Workers of America, in a statement issued Feb. 15. New federal laws are "not the answer" to the mine safety problem, Mr. Baima said, but rather "stricter enforcement of the agreements between miners and operators and of the laws now in force in the various states."

Orient Cause Probed

The Illinois investigation into the cause of the Orient No. 2 explosion began

Feb. 11 at Benton and was recessed after 3 days, to be resumed at Springfield Feb. 25. In the interval, the commission expected to re-inspect the mine in an effort to clear up, conflicting testimony given at the hearings. Earlier on Jan. 24, State Attorney Joseph Hickman, announced that he had asked the state and federal bureaus and the UMWA for advice and information on which to base possible legal action in connection with the disaster. Mr. Eadie, in reply, said that he knew of no evidence of criminal negligence in operation of the mine.

Smoking was listed as the probable start of the Orient No. 2 explosion by H. L. Walker, head of the Department of Mining and Metallurgy, University of Illinois, in a special report to the governor Jan. 24. "My notes regarding gas-flame markings on the roof would indicate that the source of ignition was very near the caved areas . . . and that ignition very probably was caused by personal smoking," he wrote.

Its catastrophe insurance on 12 Illinois coal mines was being cancelled because premiums had not been sufficient to pay for the state's three disasters in recent years, the American Reinsurance Co. announced Feb. 13. The insurance coverage involved is that carried by the large companies which operate as "self-insured" for normal workmen's compensation payments. A spokesman for the state industrial commission called the withdrawal "outrageous" but said that coverage could be arranged through Lloyd's of London.

UMWA Hits State Chiefs

In Pennsylvania, Gov. Fine reportedly refused comment on the UMWA demands that he discharge Secretary of Mines Richard Maize. A resolution calling for his removal was passed last month by UMWA District 5 and it was also reported that a UMWA group in Wilkes-Barre had made similar demands. In replying to the telegram from John P. Busarello, District 5 president, Gov. Fine is said to have written that it will receive "my careful consideration."

In West Virginia, Adolph Pacifico, president, UMWA District 6, criticized Arch J. Alexander, mines chief, and William Berry, inspector-at-large, charging failure to inspect the No. 5 mine of the Valley Camp Coal Co. "It is incidents like these that make mandatory pending mine safety legislation," he said. His statement came after a state inspector had reportedly refused to accompany the mine safety committee through the mine to verify its findings that certain sections were not properly firebosed. Earlier on Jan. 21, UMWA Local 9018, at Zeigler, Ill., passed a resolution calling on Gov. Stevenson to "demand" the resignation of Walter Eadie, Illinois mines chief.

Three mines were closed by the Colorado state department following investigation of UMWA charges that 22 non-UMWA mines in Fremont County were unsafe (*Coal Age*, February, p 135). Tom Allen, state inspector, reported Jan. 28. Mine owners charged that the mines listed were independents and that the union was retaliating for its failure to organize them.

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Personal Notes

W. J. O'Connor, formerly manager of the American Smelting & Refining Co.'s Utah department, has been named president and general manager of the Independent Coal & Coke Co., Salt Lake City. He succeeds **Trevor O. Hammon**, retired, as president. **Walter F. Clarke** continues with the company as assistant general manager.

The Inland Steel Co., Wheelwright, Ky., has announced the following changes in its organization: **E. M. Pace** has been appointed mining engineer, assigned to special duties. **H. B. Smith** has been advanced to superintendent, Price preparation plant, succeeding Mr. Pace. **R. A. Jimenez**, preparation engineer, has assumed responsibility for inspection of purchased coal, which formerly was under Mr. Smith's direction. At Price Mine No. 2, which went into production last November, **Ralph Banks** has been appointed mine foreman. **J. H. Kelly** has been made mine foreman at Price Mine No. 1, succeeding Mr. Banks.

Olen E. May has joined the Paradise Collieries, Inc., in the capacity of superintendent, according to an announcement by Theron G. Gerow, president. Paradise Collieries, a subsidiary of West Virginia Coal & Coke, has operating headquarters in Greenville, Ky.

J. N. Geyer has been elected treasurer of the Imperial Coal Corp., Johnstown, Pa. He will continue to function as production engineer, in addition to his new duties.

William J. Clements, of Coaldale, Pa., a state mine inspector since 1926, was appointed Jan. 31 to the newly created post of field deputy secretary of mines for the anthracite region. In making the appointment, Pennsylvania Gov. John S. Fine said that the new position is designed "to establish closer contact between the anthracite industry and the department" and that greater safety and efficiency in coal mines could be expected as a result. Mr. Clements will maintain an office in Pottsville.

John W. Carney has been appointed superintendent, Mine No. 10, Peabody Coal Co., according to an announcement by Lynn Trovillion, district superintendent. Mr. Carney has been succeeded as mine manager at No. 10 by **Leo Gilmartin**, formerly assistant mine manager at Mine No. 8.

Fred G. Phelps, for the past 5 yr chief electrician at Powelton No. 6 mine, Coal Div., EG&FA, has been transferred to Wharton No. 1 mine, to succeed **George Page**, deceased. **Okey Hess**, a member of the electrical department for the last 15 yr, has been named chief electrician at Powelton No. 6, to replace Mr. Phelps. **Paul H. Miller**, of the engineering department, has been appointed plant inspector at Melcroft mine, succeeding **K. S. Hobbs**, who has been transferred to Federal No. 1 mine. At Kopperstown, **Arnold Branham**, formerly section fore-

man, has been promoted to panel foreman at No. 2 mine, on the evening shift.

T. M. Wyatt has joined the Hutchinson Coal Co., Fairmont, W. Va., as vice president, effective Jan. 1, according to an announcement by Robert A. Ritchie, president. A veteran of 38 yr in the coal industry, Mr. Wyatt began his career with the Consolidation Coal Co. in Jenkins, Ky. He was later associated with The New River Co., which he still continues to serve as a director. In 1920, after 2 yr with Amherst and Lundai Coal organizations, he organized, with Messrs. R. Mankin and T. H. Hooper, the Hooper-Mankin Fuel Corp. and after the death of Mr. Hooper he operated and controlled this firm until 1943. In that year, he became president of the Birch Mining Co. and vice president of the Basic Coal Co., posts he held until joining

the Hutchinson Coal Co. organization.

Edwin B. Charlton, mine foreman, Olyphant Shaft colliery, recently retired after 58½ yr of service with The Hudson Coal Co. Spending his entire working life with Hudson, Mr. Charlton entered the mines at the age of twelve and after holding other jobs, became a member of the official force as an foreman assistant in 1916. Mr. Charlton was honored on his retirement at a testimonial dinner attended by fellow mine officials and miners. Retiring at the same time and also honored at the testimonial dinner was **William Williams**, section foreman and driver boss since 1917, who had also been a Hudson employee for many years. Mr. Charlton has been succeeded as Olyphant mine foreman by **Edward Owens**, mine foreman at Grassy Island Shaft. Replacing Mr. Owens was **Jack Hodgson**, section foreman at Grassy Island.

More Personal Notes on p 150

News Briefs and Trends

Anthracite Export Group Seeks FTC Approval

Approval of an Anthracite Export Association composed of nine companies was asked of the Federal Trade Commission Feb. 18. Under the export trade act, such an association, if established with the necessary approval, would permit members to cooperate in the establishment of prices and selling methods for foreign trade, regardless of the anti-trust laws.

Mining Company Names Two Miners as Directors

The Miners Coal Co., operating the Fies mine near Madisonville, Ky., announced Jan. 23 that it had elected two employees and a representative of the public to its board of directors. According to Justin Potter, company president, the unusual step was taken to bring workers and the public into closer relationship in the management and operation of the firm. The new employee directors, elected by a secret ballot of the mine workers, are Carlos Payne, a tipple man, and James Morgan, an underground worker. Will Cardwell, of Madisonville, is the public representative. Other directors of the non-union operation elected were Mr. Potter, J. Davis, secretary-treasurer, and Kenneth Snarr, vice president and general manager.

Mines 26 Billionth Ton

The bituminous coal industry on Feb. 8 mined its 26 billionth ton produced since 1800, according to estimates by Dr. Walter L. Slifer, chief of the research and statistical section of the Bituminous Coal Institute. Runner-up to the U. S. in all-time coal production is Great Britain, which, though in its seventh century of mining, still has produced less than the 23-billion-ton output

of bituminous mines chalked up since 1900. Since the turn of the century, American mines have loaded out 26,894 million tons in all, including anthracite and bituminous. Total output for both industries since 1800 adds up to 30,953 million tons.

Jeffrey Inaugurates Program For College-Student Training

In view of the growing need for skilled engineers, the Jeffrey Mfg. Co. has inaugurated a Student Training Program designed to train interested college graduates for responsible positions with the company. Open to both juniors and seniors, the program will be run by G. B. McNaughton, of the Jeffrey industrial engineering division, who has been named director of student training. Men selected will be given a year's training and later assigned to the specific divisions to which they are best fitted, with juniors receiving credit for their summer work activity. An attractive 20-p booklet, entitled "Jeffrey, The Graduate's Career," outlining the program and the opportunities offered, has been sent to the placement bureaus in leading engineering colleges.

UMWA Announces New Plan For Special Disaster Aid

Extra disaster payments for families of miners killed in mine accidents "contingent upon finding of acute financial needs" will be paid in the future by the UMWA Welfare and Retirement Fund, it was announced Feb. 9. Under the new plan the extra money will be paid if the Fund finds that its regular death and maintenance payments are insufficient, but no set amounts have been fixed for the special grants.

More News Briefs on p 160

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SPEAKERS AT RED JACKET SAFETY DINNER—Paul D. Ritter (left), president; Julius Howell, assistant superintendent, Mine No. 17; Arch J. Alexander, chief, West Va. Dept. of Mines; William M. Ritter, vice president and general manager, Red Jacket Coal Corp.; E. R. Maize, safety director, National Coal Association; J. J. Plasky, training and safety director, Red Jacket; H. J. Sloman, assistant to the director, USBM, and J. F. Maurice, chief engineer, Red Jacket.



6 YR AND 5 YR OF ACCIDENT-FREE SUPERVISION—Haywood Dean (left) and T. J. Jordan, mine foremen of Junior and Wyoming mines, respectively, achieved 6-yr records. In the right photo, Norman Presley (left), Keen Mountain mine, and Charles Turk, Mitchell Branch mine, receive 5-yr awards from Mr. Sloman.

Red Jacket Honors 82 Foremen for Safety

SIX YEARS OF ACCIDENT-FREE SUPERVISION is the remarkable record achieved by both Haywood Dean, and T. D. Jordan, mine foremen of Junior and Wyoming mines, respectively, of the Red Jacket Coal Corp. Also cited for outstanding safety performance at the company's 6th annual safety dinner Jan. 19 at the Mountaineer Hotel, Williamson, W. Va., were 80 other Red Jacket supervisors who have completed from 1 to 5 yr of supervision without accidents among their crew members.

The Red Jacket Trophy for top 1952 safety performance among the company's mines was won by Mine No. 17 and presented by Paul D. Ritter, company president, to Julius Howell, assistant superintendent, Mine No. 17, who accepted the trophy for the mine personnel.

Guests of the company included a number of civic leaders and officials of

the Bureau of Mines and West Virginia Department of Mines. Speakers were: Paul D. Ritter, president; W. M. Ritter, vice president and general manager; J. F. Maurice, chief engineer; J. J. Plasky, training and safety director; Julius Howell, assistant mine superintendent, Red Jacket Coal Corp.; H. Prentice Farley, chairman of the safety commission; Arch J. Alexander, chief, West Virginia Department of Mines; E. R. Maize, safety director, National Coal Association; H. J. Sloman, assistant to the director, USBM, Washington, D. C., and J. T. Whalen, supervising inspector, USBM, Logan, W. Va.

Messrs. Dean and Jordan each received a U. S. Savings Bond and an engraved certificate in recognition of their efforts. Two other Red Jacket supervisors, Norman Presley, Keen Mountain mine, and Charles Turk, Mitchell Branch mine, were awarded engraved

safety clocks for achieving 5-yr accident-free records as mine supervisors. The four men will be guests next summer of the company and the National Coal Association at a Washington, D. C. meeting of foremen from all over the nation who have outstanding safety records.

The Red Jacket Honor Roll also includes eight men with 4-yr accident-free records, 17 men in the 3-yr group, 19 men with 2-yr records and 34 with 1 yr of accident-free supervision. In addition, 22 men received honorable mention. Men with 1-, 2-, 3- and 4-yr records are:

4 Yr Without Accidents—T. E. Sizemore, Fred Shannon, Sephas Wicker, Dayton Johnson, A. K. Hooker, Leonard Skeens, Homer Mahone and Don Shields.

3 Yr of Accident-Free Supervision—Henry Hill, W. M. Harlow, Curt Matney, Frank Stout, Joe Henderson, Jim

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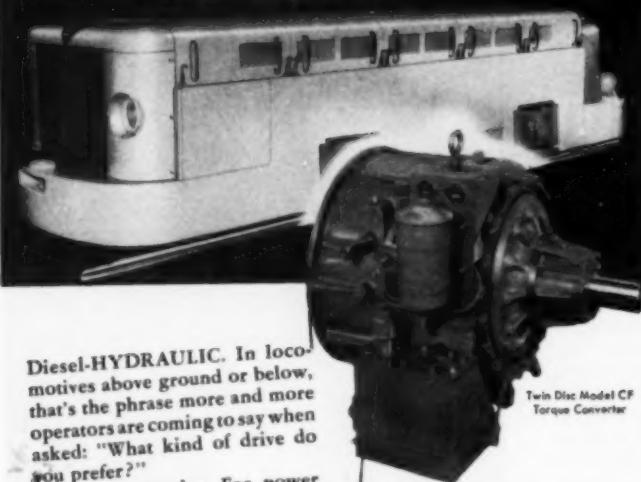
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2 Yr With Complete Safety—Russell Williamson, John Halle, Ed Simpkins, Frank Melmige, Joe Hatfield, Walter Asbury, Jim Maynard, Nathan Maynard, Charles Cox, Dale Browning, Bill Lester, Ralph Phillips, Pat Leslie, Tommy Short, Bill Curry, Herbert Williamson, L. E. Ratliff, Arthur Joyce and Roger Hooker.

1 Yr Without Accidents—Dexter Vance, Miller Plymal, Clyde Hilton, John Spradlin, S. A. Cook, Leonard Lawson, Ivory Killen, J. M. Hutchinson, J. H. Damon, W. D. Dye, T. A. Copley, Fred Thomas, Willard Graham, Emory Osborne, Dorsey Steele, Bill Hicks, P. G. Willis, F. C. Daniels, Ace Kennedy, Dan Hammond, Raymond Simpkins, J. Carl Cook, Rufus Sipple, James Hite, Walter Edwards, Lewis Simpkins, Clyde Hammond, Jay Walls, Clyde Vance, Onnie Fortner, Isaac Hoover, Paul McCoy, Tom Franklin and Golden Barrett.

AMC Reports Program For Coal Convention

Over 1,500 representatives of the nation's coal mining industry are expected to meet in Cincinnati, Ohio, May 5-7, at the 1952 Coal Convention of the American Mining Congress, to discuss the latest developments in coal utilization; materials and machinery procurement under the Controlled Materials Plan; progress in continuous mining, rehabilitation of lands mined by striping methods, mine safety, preparation of coal for markets, and other mine operating advances.

Under the direction of Kenneth A. Spencer, president, Pittsburg & Midway Coal Mining Co., a convention program has been developed which features 10 sessions devoted to current industry problems. In addition, luncheon meetings will be held on May 5 and 6.

According to the preliminary program, recently released, the initial session, Monday, May 5 will be opened with an address by Joseph Punglove Jr., vice president, Pittsburgh Consolidation Coal Co., on "New Developments for Coal Utilization." He will be followed by a discussion of "Materials and Machinery for Coal Mines" participated in by top government officials charged with the responsibility of providing adequate machinery, equipment and supplies to maintain coal production. These officials include Charles W. Connor, Administrator, Defense Solid Fuels Administration, Edward T. Klett, Deputy Administrator, DSFA, and Harold A. Montag, director, NPA Mining Machinery Div. A luncheon session that day, will feature an address by one of the key officials responsible for the defense mobilization program.

Two afternoon sessions will be held on May 5. At the mine-roof-support session the following topics will be discussed: "Wet and Dry Roof Drilling," by C. E. Linkous, director of safety, Island Creek Coal Co.; and L. F. Lu-

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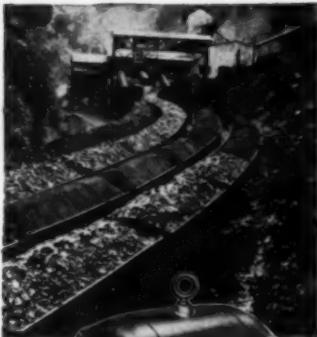
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COMING MEETINGS

American Power Conference: sponsored by Illinois Institute of Technology, first annual meeting of group formerly known as Midwest Power Conference, March 26-27, Sherman Hotel, Chicago.

American Society of Lubrication Engineers: 7th annual meeting and lubrication show, April 7-9, Hotel Statler, Cleveland.

American Mining Congress: 1952 Coal Convention, May 5-7, Netherland Plaza Hotel, Cincinnati, Ohio.

Tenth Annual Anthracite Conference: May 8-9, Lehigh University, Bethlehem, Pa.

Southern Appalachian Industrial Exhibit: May 14-16, Bluefield, W. Va.

Rocky Mountain Coal Mining Institute: 47th annual convention, June 2-4, Broadmoor Hotel, Colorado Springs, Colo.

Mine Inspectors' Institute of America: 42nd annual convention, June 9-11, Sterling Hotel, Wilkes-Barre, Pa. (Secretary, C. A. McDowell, 427 Park Ave., California, Pa.)

maghi, president, Lumaghi Coal Co.; "Roof Bolting in Pillar Recovery," by James L. Gilley, USBM engineer, Mt. Hope, W. Va.; and "Overall Economics of Roof Bolting," by Donald B. Shupe, superintendent, Eastern Gas & Fuel Association.

The strip mining session will include papers by John L. Romig, assistant manager, Technical Div., Atlas Powder Co., on "Overburden Blasting Techniques"; S. F. Sherwood, general manager, Central Indiana Coal Co., on "Road Construction and Maintenance"; and J. S. Harmon, general superintendent of stripping, Hanna Coal Co., and Talhurst Butler, Central Pennsylvania Quarry Stripping & Construction Co., on "Progress of Rotary Drilling."

The second day of the meeting will feature sessions on new mining developments, underground haulage, continuous mining and strip mining.

At the "New Developments" session, a panel of coal operators will describe their experiments in this country with European-designed mining equipment, followed by a discussion of the use of augers in underground coal mining. Among the speakers on "New Developments" will be A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., and Richard Todhunter Jr., general manager, Barnes & Tucker Co. A new means of breaking coal at the face through the use of a chemical cartridge called "Chemicol" will be outlined by R. D. Hedreen, assistant manager of the sales office of E. I. duPont deNemours & Co., Inc., Chicago.

The session on underground haulage

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COAL AGE • March, 1952



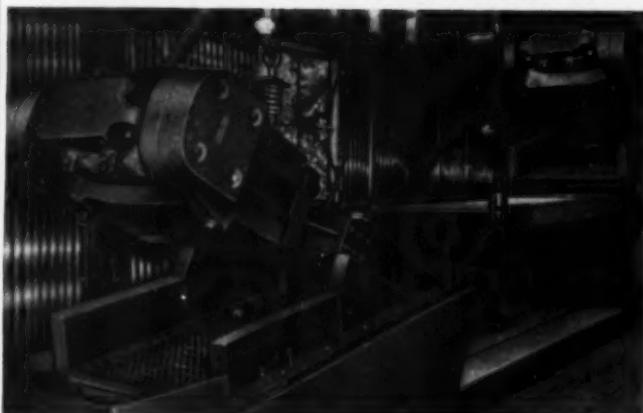
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SYNTRON MATERIAL HANDLING EQUIPMENT CATALOG 519

SYNTRON COMPANY

Harrisburg, Pa.

will feature "Slope Sinking at Peabody No. 10 Mine," by a representative of the Peabody Coal Co.; "Modern Track Haulage," by Walter R. Kirkwood, chief mine inspector, Tennessee Coal & Iron Div., U. S. Steel Co., and B. M. Neel, assistant general superintendent, Stonega Coke & Coal Co.; and "Belt Installation, Maintenance & Repair," by W. A. Haslam, assistant to vice president, The New River Co., and A. E. Long, general superintendent, Clearfield Bituminous Coal Corp.

The luncheon session, May 6, will be highlighted by an address on the American system of free enterprise by Dr. Kenneth McFarland, educational consultant, General Motors Corp.

In the afternoon, a panel of coal operators will present a symposium on the progress being made through the use of various types of continuous-mining machines. Among those participating in this symposium will be Milton H. Feis, consulting engineer, Alabama Power Co.; Frank Zachar, general superintendent, Christopher Coal Co.; and Gerald Von Stroh, director, Mining Development Committee, Bituminous Coal Research Inc. At this session also, J. A. Younkins, assistant general superintendent, Duquesne Light Co., will describe "Pillar Extraction With Continuous Machines."

Also scheduled for another afternoon session on May 6 are A. F. Lee, district engineer, Trux-Traer Coal Co., and Paul Goddard, vice president, Carey, Baxter & Kennedy, who will outline "Strip Methods in High Overburden." "Stripped Land Rehabilitation" will be discussed by Frank J. Foresman, personnel director, Pittsburg & Midway Coal Mining Co.; and Thomas C. Cheasley, chairman of the AMC Land Use Technical Committee, will bring coal mining men up-to-date on "Stripped Land Use Developments."

Subjects scheduled for discussion at the three sessions on the last day of the meeting and the speakers include: "Modern Lubrication Practices," R. M. Johnson, Blue Bird Mining Co., and Harold Lowry, maintenance engineer, Snow Hill Coal Corp.; "Underground Power Transmission," by a representative of the Union Pacific Coal Co.; "Maintenance for a Continuous Mining Section," J. J. Snure, production manager, and G. W. Stump, assistant production manager, Rochester and Pittsburgh Coal Co.; "Fire Prevention for Belt Conveyors," C. W. Thompson, manager, National Mines Corp.; "Man-Trips for Track and Belt Haulage," Don Conoway, engineer, Robinson & Robinson, and F. F. Stewart, superintendent, Jewell Ridge Coal Corp.; "Coal-Dust Control Underground," R. Emmet Doherty, Anthracite Institute; "Heated Cloth Screening," John E. Dunn, Allis-Chalmers Mfg. Co.; and Milo W. Summers, vice president, Westmoreland Coal Co.; "Water Clarification and Sludge Recovery," James P. Blair, coal preparation engineer, Heyl & Patterson, Inc.; and "Dense-Media Separation by Tromp Process," J. W. MacDonald, chief engineer, Old Ben Coal Corp.

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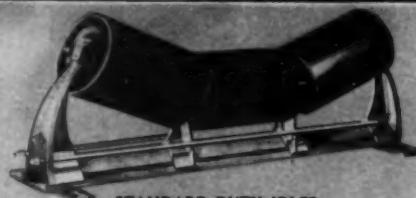


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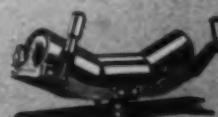
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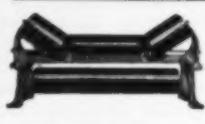
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New Mine Developments

Pittsburgh Consol Leases Land Forms New Operating Firm

Pittsburgh Consolidation Coal Co. Feb. 5 announced completion of two transactions involving the lease and sale of coal mines and reserves in the Freeport field, northeast of Pittsburgh. One consists of the lease to Republic Steel Corp. of Renton No. 6 mine, at Newfield, with approximately 3,000 acres of metallurgical coal. In operating Renton No. 6, Republic will coordinate raw-coal facilities at the mine with its own recently rebuilt preparation plant at Russellton, thus providing a high-quality coal for steel making.

In the other transaction, the National Steel Corp. and Pittsburgh Consol have combined certain acreages in the Freeport field and jointly leased some 6,000 acres to a newly formed corporation, the Renton Coal Co., which is owned 60% by Pittsburgh Consol and 40% by National Steel. The new company has acquired Renton No. 3 mine from Pittsburgh Consol, with its plants and equipment, and will use these facilities to mine the jointly leased acreage. Offices of the new Renton Coal Co. will be located at Library, Pa., and officers are: G. A. Shoemaker, president; G. W. Kratz, vice-president and secretary; and H. K. Yontz, treasurer.

The new arrangements, it was reported, will permit a more orderly and efficient mining of reserves in the Freeport field and assure a use in keeping with the quality of the coal. They represent additional steps in Pittsburgh Consol's recently announced intention of making long-term arrangements with its customers and will meet the increased coal requirements of these growing steel companies with a minimum of capital investment needed.

TVA Lets Big Coal Contract

A contract to furnish 7,650,000 tons of coal to the TVA Johnsonville and Shawnee power plants has been awarded to the Magnolia Mining Co., Madisonville, Ky., the TVA reported Jan. 23. The company is to deliver 150,000 tons this year, with the remainder supplied at a rate of 750,000 tons annually beginning in 1953. Total cost of the coal is estimated at \$26,077,500. According to reports, Magnolia Mining will open a new underground mine at Coitown, near Madisonville. The new mine will employ some 200 men and is expected to double the company's current output.

Ayrshire Leases Park Land In Illinois for Stripping

Coal rights under a 117-acre section of Kickapoo State Park, located about 10 mi west of Danville, Ill., were recently acquired at auction for a reported \$50,000 by the Ayrshire Collieries Corp., the only bidder. According to reports, workable coal deposits underlie some 64 acres of the tract and the company plans to begin stripping this summer. It is expected that it will require about 3 yr to complete mining of the area, which is served by the N. Y. Central R.R. Proceeds of the sale will be applied by the state to the improvement of Kickapoo Park facilities.

47-Yr-Old Producer Closes

The Thealka mine of the North-East Coal Co., Johnson County, Kentucky, has been closed after some 47 yr of continuous operation, it was reported Feb. 3. The property was originally opened by the Keyser Coal Co. in 1905 and acquired by North-East a few years later. At one time it employed 400 men and produced 3,000 tpd. Some 150 men were employed at the time it was shut down.

Lease by the Clinchfield Coal Corp. of coal lands near Clintwood, Va., to four operators recently was announced by Ted Blise, Clinchfield land agent. The companies involved are McFall & Pressley, Baker Bros., Lambert Bros. and Fleming Coal Co., all of Clintwood. The total acreage was not disclosed.

The Ritter Coal Co., DuQuoin, Ill., has acquired some 200 acres of land in Randolph County, near Sparta, Ill., and expects to begin development of a striping property this summer, with plans for



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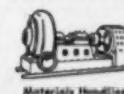
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COAL AGE • March 1952

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full production by winter. The mine will be served by the Gulf, Mobile & Ohio RR., and plans for the construction of a railroad siding, tipple and preparation plant are included in the project. Overburden on the property is said to range from 40 to 50 ft. Ritter Coal, owned and managed by Leo J. Ritter, currently operates the Red Fox No. 2 mine, near DuQuoin.

The newly organized Alma By-Products Coal Corp., McCarr, Ky., is reportedly planning development of a 2,500-tpd mine in Pike County, with shipments to be made via the N.W. Included among the incorporators are Edward Nowlin and J. A. Ruby.

The Zenith Coal Co. began coal loading Feb. 11 at its newly developed strip mine 13 mi south of Hayden, Colo. According to reports, some 200,000 yd of overburden has been removed and full-scale loading is expected to begin in May with arrival of additional machinery.

The new \$1-million coal-washing plant now under construction by the Dominion Steel & Coal Corp., at Sydney, N. S., is expected to be in operation early this spring, it was recently reported. Construction of a new tunnel from the plant to the shaft bottom is expected to double capacity of the Princess colliery, it was said.

The newly incorporated Squash Collieries, Ltd., is reportedly undertaking development of a coal mine on Vancouver Island originally opened in 1835 and believed to be the first discovered in British Columbia. Located about 195 mi from Vancouver on the east coast, the property is said to have produced some coal for the British Navy from surface deposits in 1850. In 1908, a 6-ft seam was found on the 170-ft level and more than 10,000 ft of tunneling is said to have been completed on this level, with 26 faces opened for mining. The property recently reverted to the Crown, the company stated. President of the new organization is H. C. Ketcheson, formerly with the Vancouver investment firm of Walker & Worsley, Ltd., who will devote full time to its development. Engineering and development will be supervised by Hope Engineering, Ltd., a new British Columbia firm affiliated with the Harry M. Hope Engineering Co., of Seattle and New York.

Preparation Facilities

Slab Fork Coal Co., Mary Gaston mine, Slab Fork, W. Va.—Contract closed with McNally Pittsburg Mfg. Corp. for pneumatic-cleaning addition to present cleaning facilities, consisting of one McNally-Brusset vacuum jig for dry-cleaning 27% tph of $\text{X} \times 0$, complete with attendant raw, clean-coal and refuse conveyors; remodeling of existing facilities providing for by-pass of raw coal for wet-washing and centrifugally drying



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Pittsburgh Coal Co., Renton No. 3 mine, Renton, Pa.—Contract closed with McNally Pittsburg Mfg. Corp. for one No. 524 McNally-Norton automatic washer for cleaning 250 tph of 4x0; air and water capacities to be installed to allow for future increases in washer capacity.

Glen Alden Coal Co., Truesdale colliery, Plymouth, Pa.—Contract closed with Wilmot Engineering Co. for one 8-ft-diameter Wilmot Hydrotator to prepare No. 4 coal, feed capacity, 100 tph.

Clean Coal Co., Bellaire, Ohio—Contract closed with Jeffrey Mfg. Co. for one shaker screen, capacity 250 tph, R-O-M.

Harry J. O'Brien, Pine Grove, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table for cleaning No. 4 buck.

Carbonera Ancos, S. A., Brazil, S. A.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck coal-washing table for cleaning $\frac{1}{16}$ x $\frac{1}{32}$ -in fraction.

Pittsburgh Coal Co., Renton No. 3 mine, N. Bessemer, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty Diagonal-Deck coal-washing tables for cleaning minus $\frac{1}{2}$ -in jig refuse and one Concenco No. 109 revolving feed distributor arranged for two-way distribution to two tables.

Bethlehem Collieries Corp., Ellsworth, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty Diagonal-Deck coal-washing tables for handling feed from hydrotator sumps.

Utah Miners in 20-Day Strike Successfully Oust Doctor

A 20-day strike of 1,500 UMWA members at coal mines of the U. S. Steel Corp. and Kaiser Steel Corp. ended Feb. 13 when Dr. Frank V. Colombo resigned as industrial physician for the two companies. The stoppage affecting some 11,500 tpd of coking coal was a "wildcat strike" brought by "dissident factors of miners" seeking to force the companies to take over Dr. Colombo's hospital at Dragerton, Utah, so that a Welfare Fund doctor could run it, reports indicated. Dr. Colombo, a leader in rescue operations at an explosion in the area in 1945, had been removed last fall from his connection as the Fund doctor, but continued his practice and operation of the hospital which he acquired from the companies in 1948. According to reports, J. E. Brinley, president, UMWA District 22, admitted that the strike was a violation of the contract and had unsuccessfully tried to get the men back to work. A part of the miners involved reportedly had expressed their support of Dr. Colombo. In resigning from his position, Dr. Colombo made a tentative agreement to sell the hospital back to the companies.

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DUST CONTROL



PERSONALS . . . From p 132

J. B. Morrow retired from the board of directors of the Pittsburgh Consolidation Coal Co., effective Feb. 1. At the same time, Mr. Morrow announced that he and N. G. Alford planned to form, as of Feb. 15, the independent engineering consulting firm of Alford, Morrow & Associates, as successors to Newell G. Alford & Associates. The new firm, which will have offices in the Oliver Bldg., Pittsburgh, will specialize in coal mining and preparation, property evaluations, and prospecting, development and mapping work for the mining industry. Mr. Morrow, who retired last spring as first vice president of Pittsburgh Consol, had been a director of the company since it was formed in 1945.

E. C. Weichel, vice president, The Hudson Coal Co., was elected to the Anthracite Board of Conciliation last month to represent the Northern Field operators, filling the vacancy caused by the death of Edward Griffith.

The retirement of Mrs. James E. Hart, secretary-treasurer of the Princess Elkhorn Coal Co. since its founding in 1940, was announced last month by David L. Francis, president. At the same time, Mr. Francis announced that Russell Harman, company auditor at David, Ky., since 1941, would succeed Mrs. Hart and that he would also become secretary-treasurer of the Princess Elkhorn Sales Co., the Powellton Coal Co. and Mallory Stores, Inc. James R. Camicia has been promoted to succeed Mr. Harman as auditor of Princess Elkhorn Coal Co. In addition to an active interest in community affairs, Mr. Harman has been a director of the National Association of Foremen for the past 2 yr and also is the newly elected president of its Princess Elkhorn chapter.

Raymond E. Salvati, president of the Island Creek Coal Co., has been elected a director of the National Association of Manufacturers. It was recently announced by Earl Bunting, NAM managing director.

Chester N. Trux Jr., of New Kensington, Pa., has been appointed an instructor in mining engineering in the Department of Mining and Metallurgical Engineering at Lafayette College. A graduate of the University of Pittsburgh, Mr. Trux was employed in the engineering department of the Allegheny & Pittsburgh Coal Co. before joining Lafayette.

C. E. White has been appointed district superintendent of mines, North Central district, Consolidated Mining & Smelting Co. of Canada, Ltd., Trail, B. C.

D. Owen Hartigan, president and general manager, Indian Cove Coal Co., Sydney Mines, N. S., has been appointed a member of the Dominion Coal Board. The six-man group advises the government on matters pertaining to coal and administers the federal coal subventions.



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No. 86A is 20" high and will lift 5 tons 13". Most mines use it for retailing, moving and adjusting machines, conveyors, etc.

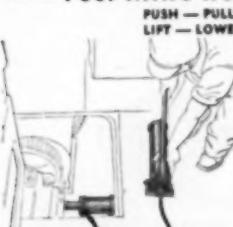
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No. 85A is 17" high and lifts 5 tons 10". Otherwise like 86A, but requires less space.

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No. 84A is 14" high, lifts 5 tons 7" and weighs only 28 lbs. Has all the famous Simplex safety features.

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RE-MO-TROL—Hydraulic Pump and Remote-controlled Ram—is invaluable wherever heavy work turns up in mines, or force must be exerted from unusual directions. It's a jack. It's a pump. It's a pusher. It's a power-hoist—and it applies hydraulic force safely from a distance. Re-Mo-Trol Units are available in 10 to 100-ton capacity.

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The Export Picture:

European Coal Deficit Still High in 1956

Western European countries will have a coal deficit of some 38 million metric tons in 1952, and, even with extensive modernization and increased output, will still fall short of required goals by some 25 to 35 million tons in 1956. These forecasts, reportedly prepared by European coal authorities, are understood to form the basis for high-level deliberations by the governments concerned.

According to the estimates, 1951 coal production was 451 million metric tons, as compared to consumption of 486 million. Of the deficit, some 25 million tons was imported from the U. S., about 1½ million from various sources, and the remainder from Poland. Consumption in 1952 is estimated at 504 million tons, with production of 466 million (plus 6 million for export) making a deficit of 38 million tons. While output is expected to increase by 1956 to 515 million tons (plus 6 million for export), consumption is anticipated at 540 to 550 million tons, or a deficit of 25 to 35 million.

To bring coal production up to the 1956 estimate, a capital investment of some \$2,210 million will be required, the authorities indicated. Of this, \$1,280 million can be furnished by the industry, but the rest would have to come from outside sources. The estimated investment by countries runs thus: United Kingdom, \$545 million; Germany, \$875 million; France, \$455 million; Belgium, \$225 million; and the Saar, \$100 million. In addition, various steps were recommended to close the gap between output and consumption. Included were measures designed to increase total recruitment for mines; boost worker productivity through incentives; expand the number of working shifts; broaden mechanization, etc.

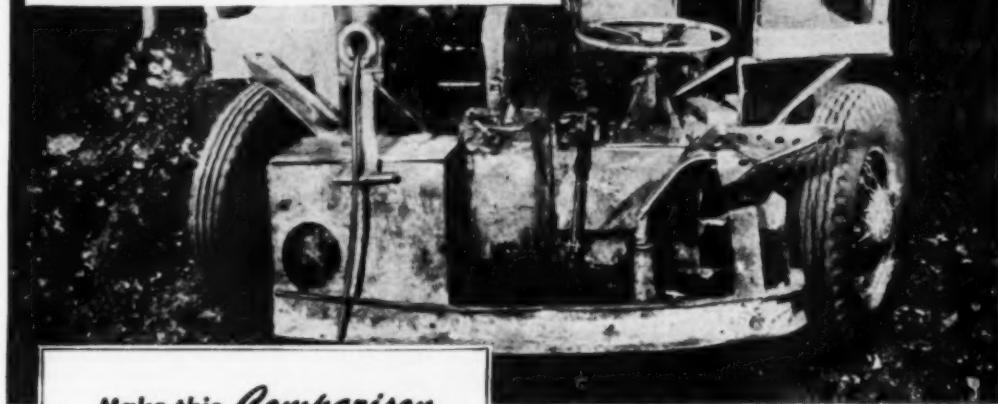
Coke output, too, will fall short of needs. Production in 1952 will run about 95 million tons, with consumption at 96.8 million. In 1956, output is estimated at 107.6 million tons, and consumption at 110.8 million.

Association Activities

Central Pennsylvania Open Pit Mining Association, at its annual meeting last month, elected the following officers: president, J. H. Wallin, Philipsburg, Pa.; executive secretary, G. Albert Stewart; vice president, B. M. DuBois, Clearfield; secretary, Ray S. Walker, Bigler; treasurer, Herman S. Moore, Philipsburg; and counsel, Frank A. Whitsett, Clearfield. A resolution calling on Gov. Fine to halt vandalism in the non-union coal fields was adopted at the meeting. The group charged that vandals had dynamited or in other ways destroyed tipples, machinery and equipment worth \$500,000.

Roger F. Cooper, president of the Kentucky River Coal Corp., Lexington, Ky., was elected president of the National Council of Coal Lessors at the annual

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and be convinced**



Make this Comparison

Check these figures, and compare typical Geoprene values with ASTM requirements.

ORIGINAL	ASTM Requirements	Geoprene Typical Values
Tensile strength, lb/sq in.	1800	3000
Per cent elongation	300	500
Set in 2-in. test piece, in.	3/8	1/16
After 7 days in Geer oven at 70 C		
Tensile strength, lb/sq in.	1600	2900
Per cent elongation	250	430
After 96 hr in oxygen bomb at 70 C		
Tensile strength, lb/sq in.	1600	2800
Per cent elongation	250	430
After 18 hr in oil at 121 C		
Per cent depreciation in tensile strength	40	35
Per cent depreciation in elongation	40	35
Tear Test		
Tensile strength, min lb/in.	40†	75

†This is the requirement for rubber jackets; no tear value has yet been set for neoprene-type jackets.



On the tough jobs—where portable tools or heavy equipment are used—specify tough, abrasion-resistant General Electric Geoprene cable. Geoprene's rugged neoprene-based jacket resists oils, acids, alkalies, sunlight, and flame. A tough, corded reinforcing mesh enables it to take the hauling and dragging that your job requires. Specify Geoprene Cable. Let it convince you by on-the-job results that G-E Geoprene cable offers extra service, extra tons per dollar.

In the full line of General Electric wires and cables you'll find the cable you need. This famous line includes such cables insulated with G-E No. 1799 varnished-cambric, Super Coronel® cable, wire armored cable, interlocked armor cable, aerial cables and mine telephone cable . . . Flamenol® control wire and magnet wire.

Send for your free copy of the 24-page booklet, *General Electric Wire and Cable for the Mining Industry*, Section W20-314, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

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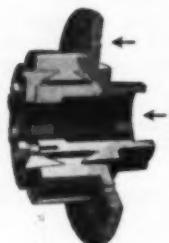
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Completely assembled Type 'T' armature,
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risers and sturdy spiders
indicated.



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since the building of the first Type 'T' D-c. Motor nearly 50 years ago, users have contributed from their experience to help Reliance engineers increase the stamina of the Type 'T' design to meet the most grueling service conditions encountered in industrial applications.

Heavy duty armatures, for example, feature cores of high-grade silicon steel punchings and shafts which have been finish-ground to assure accurate fits. All armatures are Reli-X insulated and dynamically balanced. High-riser type commutators are designed and built to meet overspeed requirements. Further facts about the heavy duty construction of armatures and other vital parts of Reliance Type 'T' D-c. Motors are detailed in Bulletin C-2001. Write for this handy reference which also gives mechanical designs, dimensions and selection data on Type 'T' Motors from 3/4 to 1000 horsepower for constant and adjustable-speed operation.

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meeting held in Washington, D. C., Jan. 22. Other officers elected were: vice president, R. D. Campbell, president, Dingess Run Coal Corp., Huntington, W. Va.; treasurer, S. T. Brown, president, Virginia Iron, Coal & Coke Co., Roanoke, Va.; and secretary, J. M. B. Lewis Jr., counsel, Pocahontas Land Corp., Bluefield, W. Va. Elected to the board of directors, in addition to the new officers, was Robert M. Fisher, attorney, Indiana, Pa.

Maurice D. Cooper, director, Mining Engineering Education, National Coal Association, has been elected chairman of the Mining Standardization Correlating Committee of the American Standards Association. Mr. Cooper has been active in the development of safety standards for conditions and equipment in coal and metal mines for many years and previously was vice chairman of the committee. H. H. Otto, assistant general manager, The Hudson Coal Co., was elected vice chairman of the committee.

Harold C. M. Gordon, general manager of coal operations for the Dominion Steel & Coal Co. of Canada, Ltd., has been awarded the Medal of the International Nickel Co. of Canada by the Canadian Institute of Mining and Metallurgy. Mr. Gordon was cited "for his great success in the management of Canada's largest coal-mining operations and for his outstanding contributions in advancing underground mechanization in Nova Scotia." The institute also awarded the Bartlow Memorial Medal to Dr. T. Binnert Hautes, a geologist for the Dominion Coal Co., for his paper, "Some Geological Aspects of the Sydney (Nova Scotia) Coalfield, With Reference to the Influence on Mining Operations." The paper was judged the best on economic geology published by the institute during the past year.

Obituaries

George E. Page, 52, chief electrician, Wharton No. 1 mine, Coal Div., EG&FA, died Jan. 4 while on his way to the hospital for a heart condition. Associated with EG&FA for a number of years, Mr. Page had been chief electrician at Wharton No. 1 for the past 6 yr, and had also been employed at its mines at Grant Town, Everettville, and Carswell.

Correction, Please

In the article, "Making Lubrication Pay," appearing in January *Coal Age*, it was incorrectly stated (middle column, p 85) that bearings are fitted with two injectors as a safety factor. Actually, this is the case only for certain critical bearings and the sentence in question should have read: "As further insurance that bearings receive the right quantity of lubricant, for maximum efficiency, according to a regular schedule, two injectors are installed on certain critical bearings which require an above-average quantity per injection."

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We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or tipple timbers from one of our treating plants. These select Osmose-treated timbers will render many years of EXTRA service.

2 We will CUSTOM-TREAT timbers furnished by you

We will Osmose-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to ANY wood species, even beech, gum, hickory, ash, elm and maple.

3 We will furnish materials and you can treat your own timber

By constructing an inexpensive vat and following directions, you can treat your own green timber with OSMOSALTS.

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that won't rot, rust, corrode

A TYPE
FOR EVERY
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M-6 with cement-type sleeve coupling.



M-2 flexible type.



M-6-T/C with male adapter.



M-1 with insert adapter attached.

YARDLEY M-1 and M-2 FLEXIBLE PIPE SPECIFICATIONS

PIPE SIZE	NOMINAL O. D.	NOMINAL I. D.	CALCULATED S. P. P. S.I.	APPROXIMATE WT. PER FT.	NORMAL SHIPPING LENGTHS
1/2"	.820	.620	540#	.093	400' Coils
5/8"	1.080	.840	350#	.141	400' Coils
1"	1.340	1.100	200#	.179	300' Coils
1 1/4"	1.640	1.360	200#	.363	300' Coils
1 1/2"	1.900	1.610	200#	.357	350' Coils
2"	2.375	2.067	170#	.434	200' Coils
3"	3.500	3.068	165#	.899	100' Coils
4"	4.500	4.026	150#	1.220	25' Straight
6"	6.675	6.065	115#	2.400	25' Straight

Whatever the need . . . for cold water or corrosive liquids, suction or discharge . . . there's a Yardley Plastic Pipe for the job.

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Send for chemical resistance charts.



YARDLEY M-6 AND M-6-T/C RIGID PIPE SPECIFICATIONS

PIPE SIZE	APPROXIMATE WT. PER FT.	NOMINAL I. D.	NOMINAL O. D.	CALCULATED BURST PRESSURE P.S.I. AT 80° F.
1/2"	.053	.476	.600	700
5/8"	.080	.715	.855	625
1"	.138	.970	1.140	550
1 1/4"	.30	1.230	1.420	525
1 1/2"	.32	1.510	1.730	490
2"	.45	2.00	2.350	400
3"	.555	3.000	3.350	375
4"	.880	4.000	4.300	342
6"	1.940	6.000	6.440	335

M-6 and M-6-T/C recommended for working pressures up to 20% of calculated bursting pressures where temperatures do not exceed 125°. For M-1 and M-2 working pressures, use 60% of calculated burst.



Why shoot birds... when there's b'ar around?

The few pennies you may save on initial cost for a lubricant are really *small game*. The *big savings*—such as reduced maintenance costs—come when you use Correct Lubrication!

For example . . . one plant, in the year following installation of a program of *Socony-Vacuum Correct Lubrication*, saved \$66,000 on machine maintenance alone! In this same period, total

cost of lubricants—including cutting oils—was only \$50,000!

In addition to *maintenance* savings, Correct Lubrication also helps you achieve more continuous production, less power loss, and lower over-all lubrication costs.

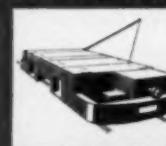
See what Correct Lubrication can do in *your* plant, mill or mine. Call your Socony-Vacuum representative today!



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A thousand and one wire ropes
PREformed and internally lubricated

The experience of hundreds of users—like yourself—goes into the making of Macwhyte Wire Rope. For more than half a century, their needs and yours have been studied by our engineers to produce the best wire rope for each job.

There are a thousand and one ropes to choose from. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company.

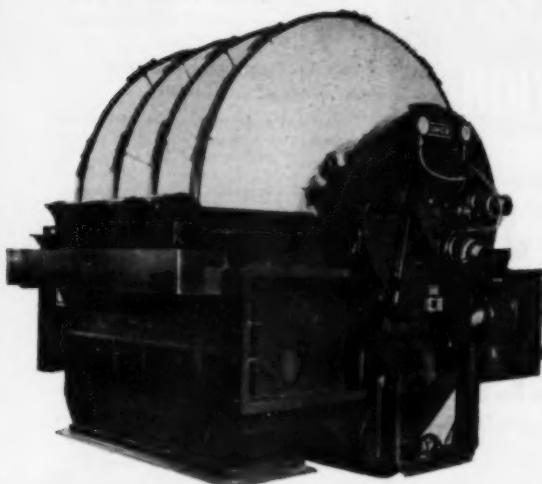
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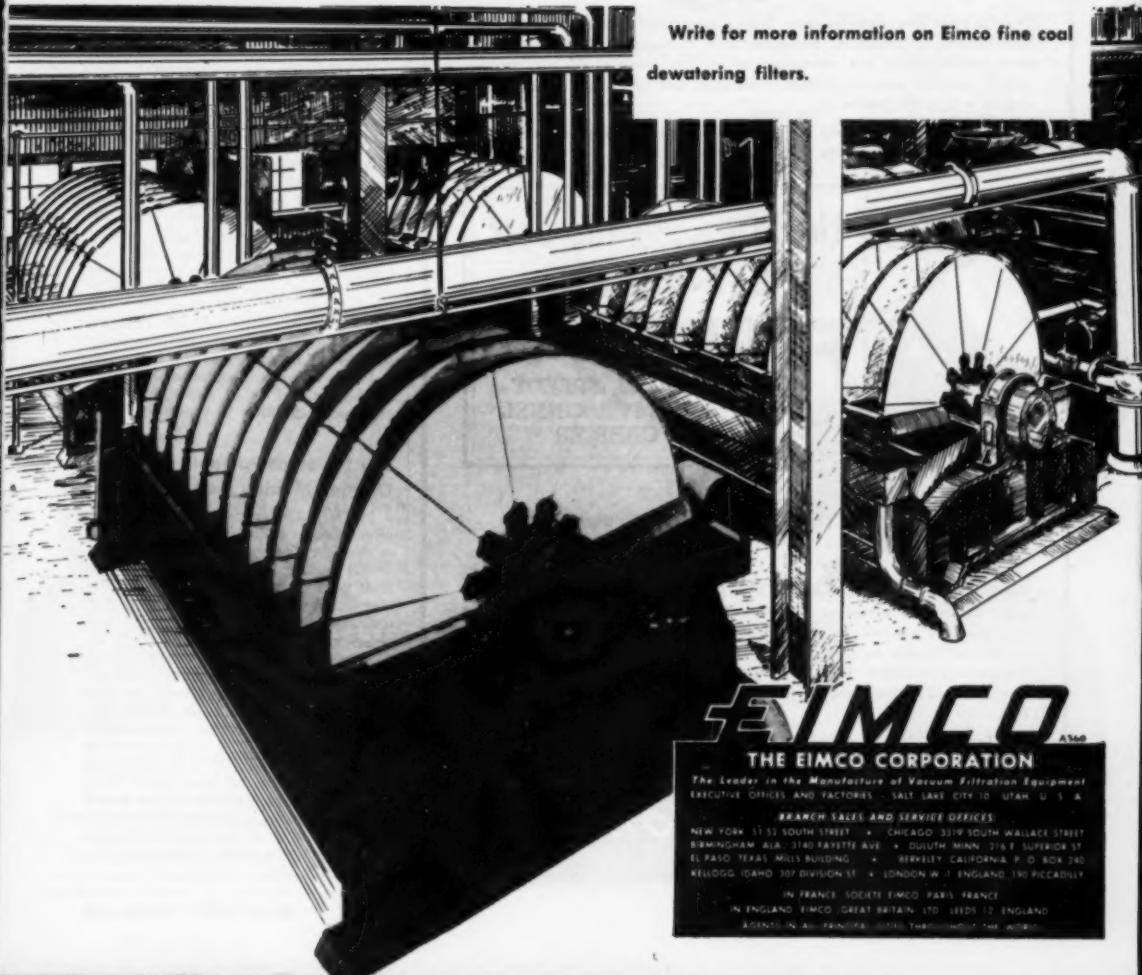


Valuable Coal Fines are being dewatered on Eimco Filters and sold at a profit in many places where they were regarded as waste.

A clear water discharge from your Eimco filter means that every bit of coal cut and delivered to the washer is bringing its share of revenue.

Eimco Agidisc filters offer many advantages over other types of dewatering equipment, such as: low initial investment, lower moisture content in the coal cake, even drying, greater tonnage per square foot, per hour and small floor space requirement.

Write for more information on Eimco fine coal dewatering filters.



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The TJI Mine Jeep provides safer, faster underground transportation for Mine Superintendents, Engineers, Inspectors, and Maintenance Personnel to and from working faces and emergency areas. Its many applications include pulling man-trip cars, fire-fighting equipment, and conversion to ambulance duty at a moment's notice.

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Quick, independent transportation for Mine Mechanics, Pumpers, Fire Bosses, and other maintenance personnel at one-half the cost with the Lee-Norse Scooter! Approximately one-half the size of the Mine Jeep, the Lee-Norse Scooter is rugged and simple in design, incorporating many standard Mine Jeep parts. Weight—approximately 1000 lbs.; Wheel Base—48"; Overall Length—8'0"; available in all track gauges, 36" to 48". Headlights available at slight additional cost.

The Lee-Norse Scooter provides low-cost run-about transportation when and where it is needed! Write today for complete information.

Lee-Norse Company
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News Briefs From p 132

Interior Department Okays Mine-Fire Control Bill

Permanent legislation for the study, control and extinguishing of coal outcrop and underground fires, with an annual appropriation up to \$1 million, has been approved by the U. S. Department of the Interior. The program is called for in a bill introduced into the House last fall by Rep. Ivor D. Fenton (R., Pa.), on which the Interior Department recently submitted a report. Although there has been no legislation authorizing federal funds for fighting mine fires, appropriations totaling \$1,463,000 in the fiscal years 1949-52 have been obtained for the Bureau of Mines for fire-control work in inactive coal deposits.

Miners Must Help Welfare Fund If Output Drops, Study Shows

It may be necessary for miners to contribute directly to the UMWA Welfare and Retirement Fund if there should be a marked decline in coal production, according to a thesis prepared by George H. Scott, of Clarksburg, a graduate student at West Virginia University. As reported by the University Feb. 20, the study finds that the fund has discharged its proposed functions efficiently and with a minimum of administrative costs but that much remains to be done. If an expanded welfare program requires an increased tonnage royalty, the resultant price increase will further weaken coal's position among competitive fuels and the pressure for miner contributions will also depend on future variations in the level of coal production, Mr. Scott says. Future plans call for enlarged benefits in the fund's present four major services and union pressure for free house water, better town sanitation, improved bathhouses and other facilities can be expected in addition, he points out.

Joy Develops Portable Oxygen-Making Unit

Joy Mfg. Co. announced Feb. 14 that after some years of development it had perfected an oxygen-producing unit that would permit industrial users to make their own oxygen at substantial savings that would run from 60 to 85% of present direct costs without amortization of machine investment. Called by J. D. A. Morrow, Joy president, "a development of great economic significance," the semi-portable units will be offered in four sizes. The first to be available will produce 2 tons of gaseous oxygen daily, 99.5% pure or better, at an operating cost of 5 to 10¢ per 100 cu ft, depending on power, water and labor costs. Forerunner of the new generator was a unit developed by Joy's Sullivan Div. during World War II at the army's request, which has been under commercial development since.



In Emergencies—

While **OUTSIDE HELP**
is on the way—
This INSIDE HELP
is on the job



M-S-A SELF-RESCUER

For immediate breathing protection in emergencies caused by fire or explosion, M.S.A. developed the Self-Rescuer. This approved safety item provides the precious minutes of emergency breathing protection so vital to the miner while traveling through carbon monoxide to fresh air.

The Rescuer is available in individual carrying cases or in Cache Assemblies for storage in working sections, on man-trip cars and along belt lines. U.S. Bureau of Mines Approved. Bulletin No. BC-1.

M-S-A "ALL-SERVICE"® MASK



In toxic atmospheres where there is sufficient oxygen, this dependable mask provides complete breathing protection against smoke, poisonous gases and fumes (including carbon monoxide), singly or in combination. Bulletin No. EA-8.

M-S-A CHEMOX®

Inside emergency efforts play an important role in the success of the overall rescue operation. Miners equipped with the M.S.A. Chemox can safely travel through any area with the complete assurance that their breathing is safeguarded. All the wearer does is breathe—the Chemox generates its own oxygen supply from a replaceable canister and can be put into service in seconds. Weighing only 13½ lbs., it is designed for freedom of movement. U.S. Bureau of Mines Approved. Bulletin No. B-14.



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MSA

BIG Tractor-shovel with **BIG** push



4-wheel drive **PAYLOADER®**

The big $1\frac{1}{2}$ cu. yd., 75 horsepower Model HM "PAYLOADER" has proven itself in the mining industry as a valuable, versatile earth mover. It gets to the job faster under its own power at speeds up to 16 mph... has traction and flotation to work on poor grounds... can excavate, strip, load trucks, backfill, bulldoze, spread, pull, push, lift and carry. It's a many-purpose handyman in the pit and around tipples, yards and preparation plants.

This tractor-shovel also makes a hit with operators because it rides easy and has a big comfortable seat, power-boosted steering and fingertip hydraulic control. Four speeds *reverse* as well as forward permit as fast operation in both directions as the job conditions allow, and there's a choice of gasoline or diesel power. Once you've seen a Model HM in action you'll understand why hundreds of owners and operators are its enthusiastic boosters.

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 $1\frac{1}{2}$ yd. Model HM or the
six other "PAYLOADER"
sizes down to 12 cu. ft.
bucket capacity.



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Safety Milestones

Amid the current debate on mine safety, management and men of hundreds of mines throughout the country steadfastly go about their day-to-day job of putting safety practices to work — without fanfare or fuss — as they mine coal efficiently.

Accomplishments like these are, of course, but one side of a complicated story, but they should be recognized as the real achievements they are by the public, government and the industry alike.

Reliance No. 7 mine of The Union Pacific Coal Co. on Dec. 31 completed its fourth year of operation without a lost-time injury, with a total of 1,606,824 man-hours worked during that period. Union Pacific Coal, as a whole, had only 24 injuries during 1951, while working 3,985,660 man-hours.

On Jan. 30, 1952, the Widen mine of the Elk River Coal & Lumber Co. rounded out 5 yr of operation without a fatality, in mining 4,198,530 tons.

In 1951, there were 32 anthracite collieries operating for 1,500,000 man-hours or more during the year without a fatality. Collectively, they worked more than 93 million man-hours without a fatal accident.

The Red Jacket Coal Corp. in 1951 had 82 foremen whose crews had worked for varying periods of 1 to 6 yr without a lost-time accident (see p 134).

These are only the latest in the series of outstanding examples Coal Age has published over the years. We will continue to welcome the opportunity of reporting any unusual records set by any coal mining organization.

Wildcat Strikes Plague Mines in Kentucky, West Virginia

Some 1,800 miners in Floyd and Letcher counties, Kentucky, were reported idle Feb. 14 at mines of the Consolidation Coal Co. (Ky.) and the Inland Steel Co. Approximately 350 men at Consol's Hendrix mine stopped work that day in sympathy with a man reportedly dismissed after absence from work. At Inland Steel's Price and Wheelwright operations, 1,500 men continued their stoppage supporting a man who reportedly had been dismissed because of refusal to follow a foreman's orders. The walkout, started the week before, had been resumed after the men had returned for 1 day the first of the week. At Bartley, W. Va., 750 miners at four operations of the Pond Creek Pocahontas Co. mines returned Feb. 7 after a 4-day walkout over the assignment and re-assignment of a brakeman and temporary brakeman. On

WEST VIRGINIA

ROOF BOLTS

Help Prevent Accidents...

Over 48% of all coal mining fatalities in 1950 and 1951 were caused by roof falls. Records show that the proper use of roof bolts decreases the number of such accidents. To enable operators to obtain better and more secure roofs, West Virginia furnishes a complete line of wedge type and expansion sleeve type roof bolts and accessories. Either type of bolt reduces roof falls, increases ventilation, and permits easier and safer operation of loading and transportation equipment. Their use spells economy.

Circular describing use of bolts and illustrating plate washers, angle washers, roof channels, etc., sent on request.

EXPANSION SLEEVE ROOF BOLT

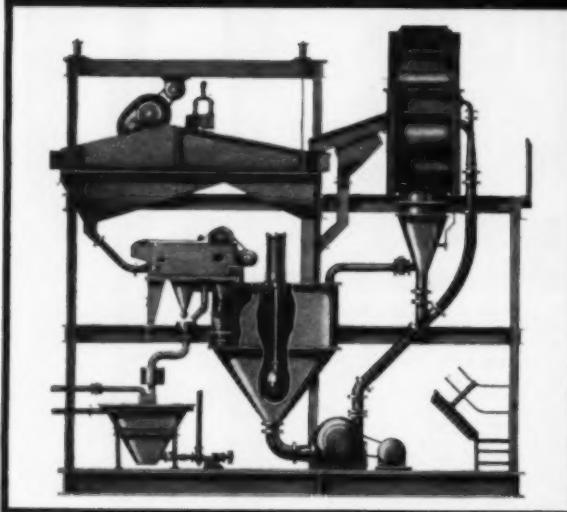
Consists of $\frac{3}{4}$ in. cut or rolled thread bolt and expansion unit. Bolt is provided with pressed ears, square, deep unchamfered head and forged integral head washer. Tightening the bolt pulls conical plug into circular tapered seat in shell, forcing teeth or shell fingers into walls of hole without possibility of edgewise distortion.

WEDGE ROOF BOLT

Consists of 1 in. cut or rolled thread bolt slotted for 6 in. and wedge with semi-roughened surfaces. Unless otherwise specified, furnished with regular square nut. Driving bolt against end of hole forces wedge further into slot, thus tightly anchoring bolt in hole.



THE  DENSE MEDIA
COAL CLEANING PLANT
WITH THE SIMPLIFIED CIRCUIT



One of the most outstanding developments in magnetite dense medium coal cleaning is the simplification of equipment and flow arrangement which is to be found in the NELDCO Dense Media Coal Cleaning System.

The importance of the medium recovery circuit in a dense media coal cleaning plant cannot be overemphasized.

The illustration above (all rights to design and invention are reserved. Patents applied for) represents improvements resulting from more than four years of careful research and the embodiment of the following unique advantages:

- (1) Assured control of uniform bath density which is the key to efficient float and sink separations.
- (2) Major reduction of magnetite losses.
- (3) Adequate and continuous purging of viscous slimes from the bath and medium recovery circuits.
- (4) Reduction in the amount of effluent process water requiring clarification. Only 20 to 30 G.P.M. need be clarified where raw coal feed rates up to 250 T.P.H. are handled.
- (5) Thoroughly proven by actual operation since March, 1951 in a washery operating three 7-hour shifts per day.

Licenses permitting use of this medium recovery circuit by manufacturers and users of other types of dense media float-sink separators will be made available by application.

Send for book entitled
"The Evolution of Cleaning Coal with Dense Media"

NELSON L. DAVIS COMPANY

DESIGNERS AND BUILDERS OF COAL CLEANING PLANTS
USING THE DENSE MEDIA PROCESS

343 SO. DEARBORN ST., • CHICAGO 4, ILLINOIS

EQUIPMENT APPROVALS

Eight approvals of permissible equipment were issued by the U. S. Bureau of Mines in January, as follows:

J. H. Fletcher & Co.—Tram roof drill; one 10-hp motor, 550 v, DC; Approval 2-797A; Jan. 2.

Goodman Mfg. Co.—Type 99-5GS-30 belt conveyor; one 50-hp motor, 440 v, AC; Approval 2-831A; Jan. 10.

Joy Mfg. Co.—Type 20BUI-2E loading machines; four motors, two 15 hp and two 5 hp, 250 v, DC; Approval 2-832; Jan. 15.

Goodman Mfg. Co.—Type 6648 Tractor-Tread loader; two 50-hp motors, 250 v, DC; Approval 2-833; Jan. 17.

Goodman Mfg. Co.—Type 667-C Tractor-Tread loader; two 50-hp motors, 220 and 440 v, AC; Approvals 2-834 and 2-834A; Jan. 29.

Joy Mfg. Co.—Type 3JCM-2CE/F and -3CE/F Continuous Miner; seven motors, two 65 hp, three 7½ hp and two 5 hp, 250 and 500 v, DC; Approvals 2-835 and 2-835A; Jan. 31.

Goodman Mfg. Co.—Type 75CB-40-44 storage-battery locomotive; Approval 1544; Jan. 11.

Fulton Mfg. Co.—Type N-30 two-cell flashlight; Approval 618; Jan. 4.

Feb. 11, some 100 men at the Alexander mine of the Valley Camp Coal Co. staged a partial-day wildcat strike to force some local members to pay a special \$2 union assessment.

Kentucky Mine Bill Given First Reading in House

A Kentucky state mine safety bill sponsored by the administration was given its first reading in the House Feb. 14, following three public committee hearings during which union and operator representatives were unable to compromise the two divergent bills they backed. Reporting of the bill followed a closed hearing in which union, operator and state officials participated. The bill as approved by the House committee contained 23 committee-sponsored amendments. In Virginia, an 84-p recodification of the state mine law introduced into the House Feb. 11 was immediately opposed by the C. P. Kelly, chief state mine inspector. Stating that he believed the bill to be a product of the USBM, Mr. Kelly said: "This is just a slap at the State Department of Labor and Industry and a crack at the little operator." A clash between operator and union representatives also was expected at hearings to be held on the bill.

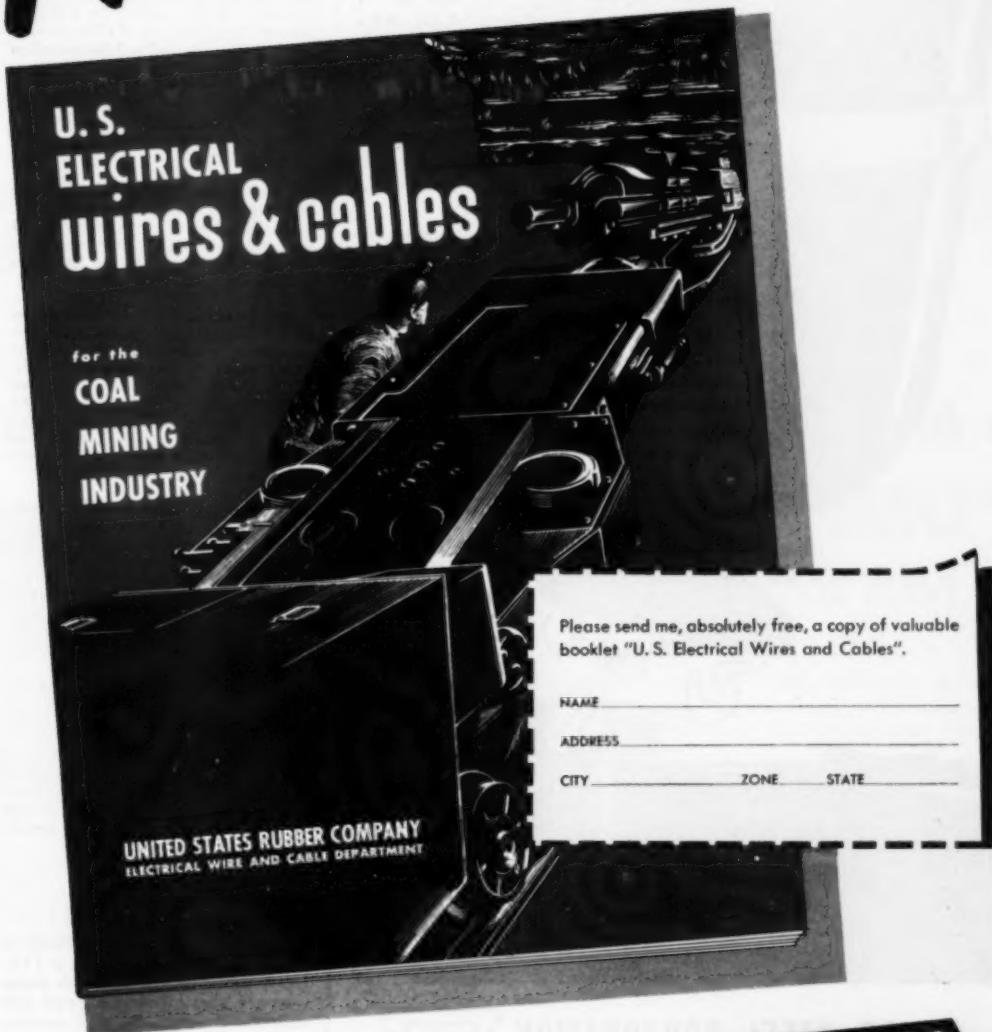
FREE!

THIS VALUABLE BOOKLET FOR THE COAL MINING INDUSTRY INCLUDES

Description of the most complete line of wires and cables for the Coal Mining Industry.

It's A Guide To

- ★ selecting the correct wire and cable
- ★ to splicing and patching
- ★ other essential information



Please send me, absolutely free, a copy of valuable booklet "U.S. Electrical Wires and Cables".

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U.S.RUBBER
SERVING THROUGH SCIENCE

Steel's "Blood Bank"

Needs your help

In normal times, steel's winter "blood bank" of iron and steel scrap is built up during the fall. But not this year. Hungry steel mill furnaces are still on a hand-to-mouth diet of scrap—and may be for some time.

Because scrap is the lifeblood of today's high steel production, your help is desperately needed.

This is why: The steel industry is growing much faster than the supply of scrap. With steel capacity now rated over 100 million tons a year, about 37 million tons of purchased scrap will be needed in 1952.

Unless this scrap is turned in there is danger that steel production may be cut in the months to come.

Pays in Cash Too

The price of scrap is another good reason for you to help. You get a good cash return by selling now.

So take these two simple steps: Survey your properties for worn-out iron and steel parts and equipment; then call your scrap dealer. But don't stop here. Make plans now to establish a regular collection program.

And For Your Information . . .

If the electric power industry is to double its war-end output by 1960, as some people believe, the coal industry will have to hike its present annual output of some 550,000,000 tons to more than 1 billion tons a year, Joseph Furglove, vice president, Pittsburgh Consolidation Coal Co., told a dinner of the New York Financial Writers Feb. 20.

The industry-sponsored shipline to haul coal abroad, proposed last fall by John L. Lewis and operator representatives, has apparently been sidetracked by government officials, it was reported last month. According to the reports, the Office of Defense Mobilization and other government agencies showed real interest when the plan was presented but have since cooled off and show no inclination to take action at the present time. Sponsors of the idea are said to still feel that it offers a workable solution to the European coal shortage.

Some 88 mine safety committeemen from nine UMWA locals in the Wilkes-Barre area enrolled last month in a 5-wk advanced course in accident prevention. The course is said to be the first of its kind sponsored by the USBM.

The government will be asked to immediately appropriate funds for the construction of a new USBM division office at Mt. Hope, W. Va., Rep. Bailey (D., W. Va.), said Feb. 5. Mr. Bailey said that he would visit both President Truman and the Budget Bureau in an effort to get the project started. Congress has appropriated \$20,000 to purchase a site and draw up plans.

Gov. John S. Fine, of Pennsylvania, presented compensation checks to three anthracite miners in person Feb. 11. The presentation symbolized worker benefits obtained under a legislative repealer passed last fall eliminating a law that denied full compensation payments to miners receiving payments from the UMWA Welfare and Retirement Fund.

A Kentucky miner, charged with assaulting Douglas Blair, operator of a small coal ramp near Barbourville during a UMWA work stoppage in February, 1950, was convicted by a Laurel Circuit Court Feb. 13, which fixed his punishment at 8-yr imprisonment. He had been convicted of the same charge of assault to kill last fall but the court of appeals ordered a new trial.

54 NEW PRODUCTS . . .

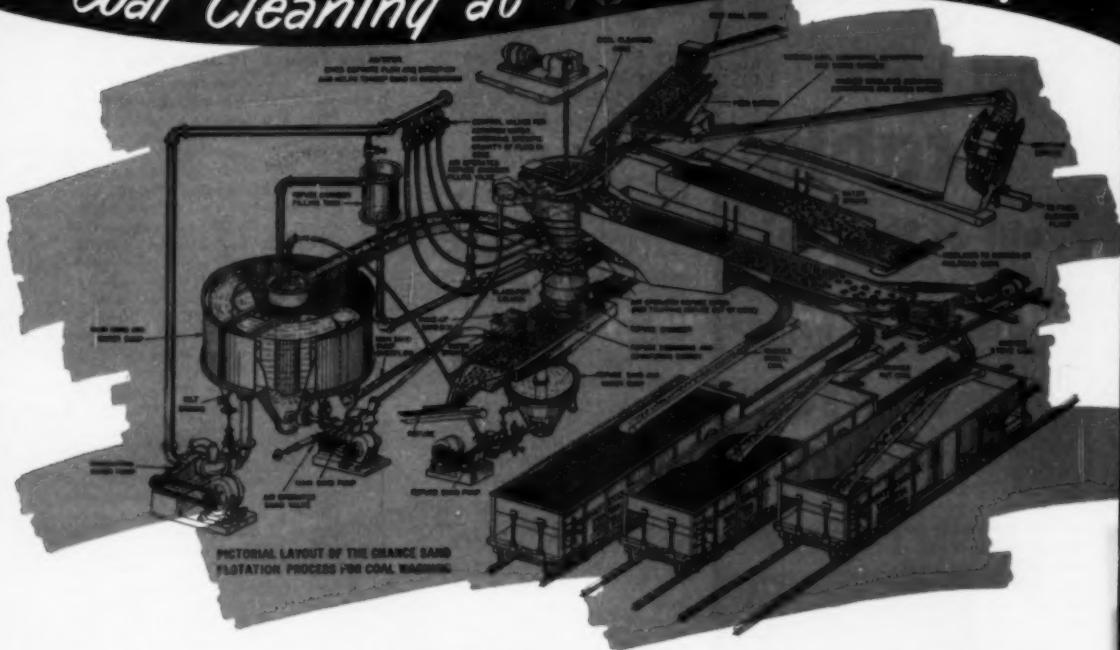
OR CATALOGS are described in this section beginning on p 114. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs? The handy postcard facing p 124 will bring you more dope on any of them—without obligation.

ARMCO STEEL CORPORATION

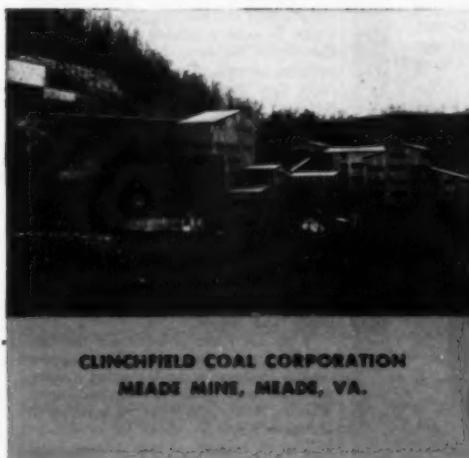
2432 CURTIS STREET, MIDDLETOWN, OHIO • PLANTS AND SALES OFFICES
FROM COAST TO COAST • EXPORT: THE ARMCO INTERNATIONAL CORPORATION



Coal Cleaning at TOP efficiency!



You'll get **GUARANTEED BEST RESULTS** with a
"FAIRMONT-BUILT"
COAL PREPARATION PLANT



CLINCHFIELD COAL CORPORATION
MEEDE MINE, MEEDE, VA.

"Fairmont-Built" **GUARANTEED** plants, over the years, show less down-time for maintenance and repairs. The well-engineered features of the Chance Sand Flotation system and the excellent plant construction assure years of steady, economical, untroubled operation.

Records prove a separating efficiency of 99% +, and a cost per ton of coal cleaned that is consistently lower than any other system.

For information on what a "Fairmont-Built" **GUARANTEED** plant can do for you, call on the Fairmont engineers.



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FAIRMONT MACHINERY COMPANY

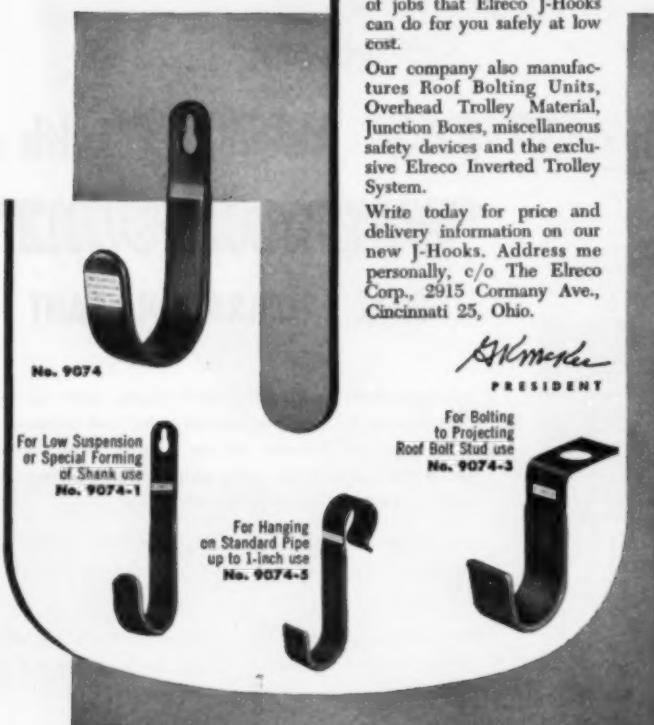
FAIRMONT-BUILT™

Fairmont, West Virginia

Designers and Constructors of Chance Sand Flotation Process for
Wet Cleaning and American Pneumatic Separator for Dry Cleaning

get your cable out of the gob!

with new
ELRECO
J-Hooks



THE **E** LRECO CORPORATION
A COMPLETE LINE OF TROLLEY MATERIAL FOR EVERY MINE

Now you can save hours in repair and installation operations — protect expensive cable and pipe from "gob" with new Elreco J-Hooks.

These handy, hooks-of-a-hundred-users are made of strong steel strip — insulated with neoprene bonded to the metal for long wear. They are tested for 10,000 volts, meet safety standards of the U. S. Bureau of Mines.

J-Hooks, fastened to mine timbers or rib with a single spike, can be used to hang bare or insulated, solid or stranded conductors. They solve the problem of hanging temporary or semi-permanent feeder, signal or communication lines and cable coils safely out of the way.

Look around your mine — you'll find literally hundreds of jobs that Elreco J-Hooks can do for you safely at low cost.

Our company also manufactures Roof Bolting Units, Overhead Trolley Material, Junction Boxes, miscellaneous safety devices and the exclusive Elreco Inverted Trolley System.

Write today for price and delivery information on our new J-Hooks. Address me personally, c/o The Elreco Corp., 2915 Cormany Ave., Cincinnati 25, Ohio.

G.W. Moore
PRESIDENT

For Bolting
to Projecting
Roof Bolt Stud use
No. 9074-3



Miner's Son Third in National Contest; Writes On Future in Industry

A coal miner's son from Grundy, Va., who wrote "The coal mining industry offers many opportunities to young men," won third prize in a national high school letter-writing contest on "How Can I Help Expand Opportunity in America" sponsored by the Schaeffer Pen Co.

Frank Bevins Jr., son of Frank Bevins, electrician for the H. E. Harman Coal Co., gained the \$100 award in competition with 2,200 students from every state.

Expressing firm faith in the industry's possibilities for him, his letter read:

"Your subject 'How Can I Help Expand Opportunities in America?' in the Nov. 14th issue of the Scholastic Magazine appeals to me very much. It is a subject I have often wondered about. Now, I am collecting my thoughts and letting you view them."

"To help expand opportunities in America I can go to school, as all boys should, and prepare to face the life of a good American citizen in my own community. My father is a coal miner and I expect to do some kind of mining, too. In school I shall study all the subjects available concerning mining, such as mathematics, chemistry, physics, plane and solid geometry and biology.

"The coal mining industry offers many opportunities to young men in the states of Kentucky, Virginia and West Virginia. These states, I have been brought up in, and I know so well the need for modern machinery and more well informed men. If these needs are solved, there will be less deaths and fewer accidents due to the lack of knowledge in mining on the miner's part and bad machinery. Thus, if I can become a mining engineer, who knows the business, I can reduce the perilous hazards of mining and produce more coal at less expense by modern machinery and methods.

"When I finish my high school work I am going to go to a technical school. I am an E student and am going to try to get a scholarship. I can pay part of my way and my father will help me. So I believe I can make it."

"I hope that I may accomplish my plans for expanding my opportunities. I know that if I can, I will undoubtedly help the common miner in my community in having a better way of living for his family and himself.

"I do not want to leave out the fact that I can also help expand the opportunities in America by becoming a voter who goes to the polls regularly and knows what he wants and what he is doing to accomplish such."

"I shall become a man among men, leading them not only to work under better conditions, but also to live better lives. I believe in the Christian life. I shall work to get miners into church. I shall try to improve social conditions among miners by encouraging YMCA Centers and other recreational organizations.

"I see great things ahead in my life as a miner among my own people."



*What's your
problem?*



C. F. Klenner, of Standard Oil's Duluth office, is the specialist who was called in by operators of this mine to help solve their lubrication problem. His practical experience and special training enabled him to recommend a lubricant that did the required job.

C. F. Klenner is one of a corps of Standard Oil lubrication specialists located throughout the Midwest. These men are especially trained to help you with your industrial or mining lubrication problems. To obtain the prompt, on-the-spot services of an experienced lubrication specialist, phone or write your local Standard Oil Company office.

When the specialist calls, discuss with him the benefits offered by such products as:

HD CAM AND GEAR Lubricant

The experience of this mining company points the way to savings you can make through the use of Standard Oil's lubrication engineering service and high quality products. How you can easily and quickly put this lubrication service to work for you is explained at the right.

Standard Oil Company, (Ind.),
ana), 910 South Michigan
Avenue, Chicago 80, Ill.

STANOIL Industrial Oils—Simplify your lubrication jobs by using this one line of oils that provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

SUPERLA Mine Lubricants—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment.

They eliminate transmission case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

Beats weather on tough lube job!

• Rain and snow washed the lubricant from the dipper stick and pinion gears . . . hot weather caused it to "melt" and run off. That meant that operators of this shovel used in a northern open pit mining project had to take time from every shift to apply new lubricant. The cost in operators' time and in lubricant was excessive. Dripping grease was untidy and unsafe.

Asked for his recommendations, a Standard Oil lubrication specialist suggested HD CAM AND GEAR LUBRICANT. The dipper stick and pinion gears were steam cleaned. The recommended lubricant was heated and brushed on in a smooth, even coating. HD CAM AND GEAR LUBRICANT has stayed on the job in all kinds of weather, and the lubrication period has been extended from a single shift to as long as two weeks. Dripping has been eliminated, lubrication costs have been cut.

STANDARD OIL COMPANY



(Indiana)



SENSIBLE IDEA about hauling coal

Most mining men will certainly agree that it takes trucks with plenty of pull and push to stand up in rugged service without lagging behind schedule.

Reason enough why so many are switching to powerful Dodge "Job-Rated" trucks!

Just look over a hefty Dodge 4-tonner, for example. Under the hood you'll find a massive, yet thrifty, power plant—with 154 husky horses that will prove more than a match for even your toughest loads!

You'll find many other dependable Dodge features, too. Features like twin carburetion and exhaust system, sodium-filled exhaust valves, and surface-hardened bear-

ing journals—all there to assure utmost dependability, long life and low-cost operation in mining service.

And, brother, talk about payload! You can really pile the coal on a Dodge—thanks to its broad-shouldered frame, extra-sturdy axles, and better weight distribution!

So rely on powerful Dodge "Job-Rated" trucks for your toughest jobs. There's a model factory-engineered to meet your needs . . . to save you money . . . to last longer. Plan now to visit your nearby Dodge dealer—soon, for plenty of sensible ideas about hauling coal the "Job-Rated" way.

DODGE "Job-Rated" TRUCKS

9 reasons why reliable **REDSHOT** is the choice of the blasting crew

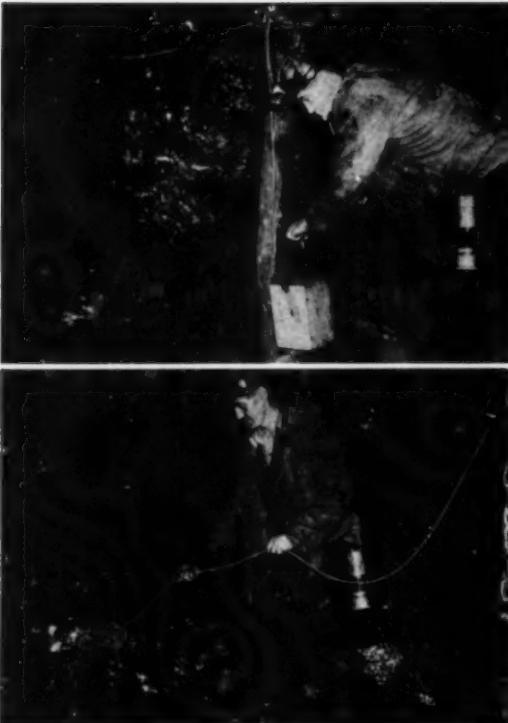


Made to the specifications of the explosives engineer... that's Hazard Redshot. Precision manufactured for mining operations, only Redshot can offer you these 9 important advantages:

- Extra flexible for easy coiling and uncoiling
- Bright red for added visibility
- Tough Hazaprene insulation and sheath for rugged service
- Highly flame-resistant in accordance with requirements of U.S. Bureau of Mines and Pennsylvania Dept. of Mines
- Parallel conductors to reduce conductor resistance and prevent kinking
- Insulation grooved for easy separation at connections

*Patent Applied For

HAZARD



- No fibrous fillers to absorb and retain moisture
- Uniform insulating wall prevents shorting between conductors
- Insulation is free-stripping for clean, easy splicing

Examine Hazard Redshot Type RG Shot Firing Cord . . . mail the coupon for your free sample. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

HAZARD INSULATED WIRE WORKS
Wilkes-Barre, Pa.

Gentlemen:

Please send me a free sample of the new Hazard Redshot Type RG Shot Firing Cord.

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COMPANY _____

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dependable
eye protection

keep on
the safe
side

wear
WILLSON
SPECTACLES

Combined protection, comfort and appearance make Willson safety spectacles outstanding in value. Choose from a full range of metal and plastic frames—fitted with Super-Tough® heat-treated glass lenses, or Plus-Tough® plastic lenses—every one tested for impact resistance and optical quality. Send for catalog describing our complete line of safety equipment.

STYLE AH

METAL FRAME Latest style spectacle with single bridge. Have Hi-Line temples for a "dresy" look. Also available with side shields. (Non-Ramifiable plastic frame Style WKS shown at top.)

CHOOSE YOUR
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LENSSES
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ANY WILLSON SPECTACLES

Three popular types of lenses are available for all Willson Spectacles. Clear glass, Super-Tough®, Willsonite®, Green Super-Tough® and the new Plus-Tough® lenses that combine the impact resistance of heat-treated glass with the comfort of lightweight plastic.

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See your Willson distributor or write for Catalog
WILLSON PRODUCTS, Inc.
239 Washington St., Reading, Pennsylvania

Among the Manufacturers

Top-level changes at Westinghouse Electric Corp. were recently announced by Gwilym A. Price, president. Tom Turner, formerly vice president in charge of industrial relations and with staff responsibility for headquarters manufacturing, becomes vice president in charge of the motor and control division at Buffalo, N. Y. T. L. Phillips, who until recently headed the company's East Pittsburgh divisions, succeeds Mr. Turner as staff vice president in charge of manufacturing. Elected vice presidents were Robert D. Blasier and John E. Payne. Mr. Blasier, who had headed the company's law department office, becomes vice president in charge of industrial relations. Mr. Payne becomes vice president in charge of the company's central sales district, with headquarters in Pittsburgh. He had been manager of the same district. Mr. Turner is a veteran of 30 yr with Westinghouse. Mr. Phillips 37 yr, Mr. Blasier 10 yr, and Mr. Payne 27 yr. At Buffalo, Mr. Turner succeeds L. R. Botsai, who resumes the responsibility he previously held as manager of the company's gearing division in Pittsburgh. G. H. McBride, who has served in Mr. Botsai's absence as manager of the gearing division, resumes his previous position as sales manager of that division. The ap-

pointment of George E. Goodrich as assistant manager, industrial department, Westinghouse Apparatus Div., also has been announced. Prior to his present promotion, Mr. Goodrich was resale manager of the company's Middle Atlantic district with headquarters in Philadelphia.

Barber-Greene Co., Aurora, Ill., has named Harold W. Newton and William C. Gifford assistant sales managers. Mr. Newton, who will supervise the conveyor division, joined Barber-Greene in 1936 as a sales engineer and has been manager of engineered sales since 1942. Mr. Gifford, who will function as assistant sales manager, machine sales, also joined the company in 1936 and since 1950 has served as sales office manager.

John M. Murray has been named assistant sales manager, Simplex Wire & Cable Co., according to an announcement by G. L. Roberts, vice president in charge of sales. Mr. Murray joined Simplex in 1928 after graduating from Northeastern University and has served in many capacities in both the engineering and sales departments.

D. J. Carroll Copps has been appointed general manager of the Atlas Powder Co.'s explosives department, according

COAL PRODUCTION INCREASED BY PERSONALIZED SERVICE . . .

Coal Operators Casualty Company through personalized services and engineering facilities can prove beneficial to your operations. These services result in increased production, equipment savings, lowered accident frequency and security.

In addition, prompt claims handling and effective rehabilitation of the injured promote personnel harmony and greater production efficiency.

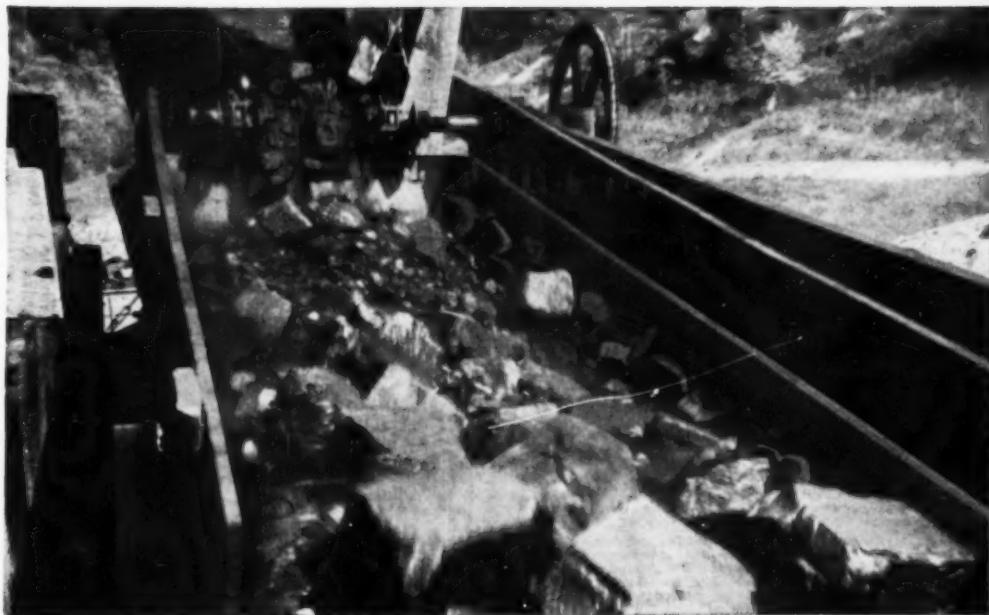
**COAL
OPERATORS
CASUALTY
COMPANY**
GREENSBURG, PA.



THE SYMBOL OF SERVICE
FOR COMMERCE AND INDUSTRY



Clean Up The R.O.M.



... and WATCH COAL PROFITS ZOOM!

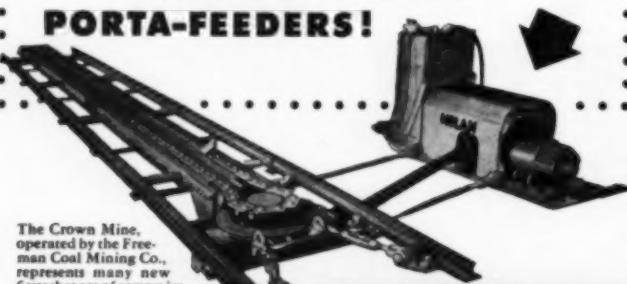
Clean coal—properly sized coal . . . it's a *must* for profitable sales today. Yes, and the Seco way of screening, sizing and cleaning is winning the acclaim of profit-wise producers everywhere. Hour after hour, day after day, year after year these ruggedly built Seco vibrating screens are preparing coal for top market prices at a cost of a few pennies per ton. It's a fact! You see, the patented equalizer assembly sets Seco apart from any other piece of equipment of this type. Only Seco has fully controlled true circular action . . . for maximum tonnages and accurate screening . . . with no bobbing . . . no weaving . . . no bogging down under the load. Over 300 models with single, double, triple and three and one-half decks . . . and with screen openings to produce any and all desired sizes.

Check Your Coal Preparation Costs Now! A SECO field man will bring you helpful modernization information, or write for Coal Bulletin #11, Dept. C.



SCREEN EQUIPMENT COMPANY, Inc.
1750 Walden Avenue, Buffalo 21, New York
In Canada: United Steel Corp.
Toronto, Ontario

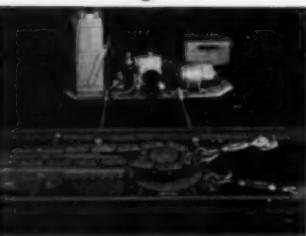
**The Crown Mine
SAVES MONEY
with Four NOLAN
PORTA-FEEDERS!**



The Crown Mine, operated by the Free-man Coal Mining Co., represents many new firsts that are of utmost importance to the coal industry. Its record capacity of 800 tons of washed coal per hour is attained with the help of four NOLAN Porta-Feeders, the industry's newest and most efficient equipment for sporting cars for loading.

The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary. The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

Because of its comparatively light weight, and freedom from need of expensive, permanent-type anchorage, the Nolan Porta-Feeder can be quickly moved as necessary, without excessive loss of time or production. No ropes or cables are used in the Porta-Feeder. High efficiency is attained through the short-shaft delivery of power and uninterrupted flow of action. Extreme ruggedness of construction assures long service life.



Strong, massive construction. No ropes or cables. Short-shaft delivery of power. Quick movability of entire unit.

Actual mine service has proved the high efficiency of the Nolan Porta-Feeder—write for full details.

MODEL	H.P.	DRAW BAR PULL	SPEED	WEIGHT
NL5N	5	6000	25 F.P.M.	5700
NL7N	7½	9000	25 F.P.M.	5850
NL10N	10	9000	35 F.P.M.	6300
NL15N	15	13000	35 F.P.M.	6750



THE NOLAN COMPANY

106 PENNSYLVANIA ST.
OWERSTON, OHIO



BEMIS BRO. BAG CO.

412 Poplar Street, St. Louis 2, Mo.

FLEXIPIPE Reg. U.S. Pat. Off.

The new improved FlexiPipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your individual requirements. Write us for complete information and sample.

to Isaac Fogg, president, who also disclosed that W. G. Frome, vice president, would continue as administrative head of the department. Mr. Copps has been assistant general manager of the department since January, 1951, and has been associated with Atlas for more than 21 yr. William C. Lytle, manager of the explosives research division, and Max E. Colson, manager of the Atlas explosives plant near Tamagua, Pa., were named assistants to Mr. Copps. Dr. William Taylor Jr., now assistant director of the company's explosives laboratory, succeeds Mr. Lytle as manager of explosives research. Roland W. Oberholzer, Mr. Colson's assistant, succeeds him as Tamagua plant manager.

John A. Roebling's Sons Co., Woven Wire Fabrics Div., Roebling, N. J., has appointed L. Wayne Nelson district sales representative for Virginia, West Virginia, Kentucky, Tennessee and North Carolina. Mr. Nelson has been a member of the division's sales administrative staff for the past 2 yr and will make his home at Roanoke, Va.

Fairbanks, Morse & Co., Chicago, has announced various changes in its sales organization, as follows: J. A. Cuneo, formerly manager of the Chicago branch, has been promoted to general sales manager, with H. L. Hilleary continuing as assistant sales manager. Milo C. Roy, manager of the Omaha branch, becomes manager at Chicago, and has been succeeded in Omaha by J. W. Wright, formerly manager of the diesel sales division. C. E. Dietle, formerly diesel department manager in the Chicago branch, has been promoted to manager of diesel sales. W. B. Wyly, manager of the Houston sub-branch, has been transferred as manager of the Atlanta branch. L. A. Weom, St. Louis branch manager, has been transferred to a similar position in St. Paul, replacing A. C. Thompson, who has retired after 45 yr of service. He has been succeeded in St. Louis by Clifford J. Schroer, formerly diesel department manager in that office. Autonomous operation for the company's electrical and scale divisions also was announced. Gordon R. Anderson, manager of the Freeport Works, has been promoted to general manager of the electrical division, with W. H. Kingsley as sales manager. George C. Worthley, manager of the scale division, has been promoted to general manager of that division, and Joe Peterson to the post of sales manager. Messrs. Anderson and Worthley will supervise both manufacturing and sales for their divisions.

A. F. Mathis has been named assistant sales manager of industrial rubber products, Thermoid Co., Trenton, N. J. A veteran of 24 yr of service with Thermoid, Mr. Mathis formerly was sales promotion manager of the industrial rubber products division.

The Denver Equipment Co. marked its 25th anniversary Feb. 9. Company offices are now located in New York,

What to look for

IN SELECTING A MODERN ELECTRIC CAP LAMP



IMPORTANT SAVINGS

IN MAINTENANCE LABOR



A most significant measure of sound engineering in a miner's electric cap lamp is *minimum maintenance*. The less work and less time needed to keep your lamps at full efficiency is a direct confirmation of superior design—and a steady source of savings for management each year.

WHEAT LAMPS deliver appreciable savings in maintenance labor costs compared to any other system of individual light for the miner, just as WHEAT Lamps produce better, more uniform light on the job!

MINIMUM MAINTENANCE

Watering of the lamps at regular intervals, occasional bulb replacement and ordinary cleanliness present all that is normally required to keep WHEAT Lamps in the best of condition.

GREATER SIMPLICITY

No covers to open, no terminals to clean, no valves to free, no cells to re-solution, no lamps to rack—*no wonder* WHEAT Lamps reduce maintenance to a fraction in time and cost!

EASY TO RENEW

When it is time to replace the battery there's never any fuss with WHEAT—just detach cable from headpiece and attach leads of a spare battery. *A new WHEAT battery means a lamp as good as new.*

"NATIONAL"—always at your service!

Our trained service representatives, district warehouses and regularly-scheduled trucks serve the inspection and maintenance needs of WHEAT Lamp installations everywhere. Call National Mine Service for a WHEAT demonstration in your mine!

**National Mine
Service Company**



Has the Facilities—Delivers the Goods

MINICO DIVISION
Southley, W. Va.

KY.-VA. DIVISION
Jenkins, Ky.

ALL-STATE DIVISION
Logan, W. Va.

ANTHRACITE DIVISION
Porty Fort, Pa.

WHITMAN DIVISION
Indiana and Alameda, Pa.

WESTERN K.Y. DIVISION
Middlesboro, Ky.



COAL MEN ON THE JOB

BLUE DIAMOND COAL CO.: In the engineering office, Leathergood (Ky.) mine—Stanley C. Goodwin (left), general mine foreman; James D. Wender, preparation engineer; R. T. Richards, draftsman; Joe Richards, engineer; and E. W. Hollyfield, assistant engineer. At Fork Ridge, Tenn.—A. L. Toliver (right photo, left), superintendent; E. T. Dyke, engineer; Carl Wyatt, tipple foreman; and E. M. Farley, office manager.

Chicago, El Paso, Toronto, Vancouver, Mexico City, London, and Johannesburg. Among the many contributions toward improving and simplifying metal-



This 8-wheel DIFFERENTIAL MINE LOCOMOTIVE is no ordinary piece of motive power. It has AXLESS trucks! Therein lies the difference between a royal ride and a regular ride.

We can't do it justice here but, in substance, this feature means greater speed with no sacrifice of safety. Means greater adhesive capacity per pound of weight.

It also means better roadability and less wear and tear on both wheels and rails. Users appreciate the simplified design which means easier servicing.

It all adds up to more tons of coal transported per dollar invested in haulage equipment and per dollar spent for maintenance. Think this over! Send for Bulletin D-52 for complete specifications.

Differential Products include: Locomotives, mine cars, mine supply cars, rock hoppers, mantrip cars, air dump cars, dumping devices and complete haulage systems.

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

IT LASTS!



Comparison tests prove ABC Brattice Cloth lasts longer. Reason: It's the finest jute fabric made for the job, specially processed to add even longer life to its natural wear resistance. Flame resistant. Mildewproof.

A B C
BRATTICE
CLOTH

AMERICAN BRATTICE CLOTH CORP.
200 So. Buffalo Street Warsaw, Indiana

How to make OLD SHOVEL PARTS OUTLAST NEW ONES!

**If you want more service
from wearing shovel parts
protect them with STOODY ALLOYS**

ORIGINAL EQUIPMENT SIZE IS RETAINED. As most parts lose size, they also lose efficiency . . . worn teeth and worn bucket lips don't take a full bite. Worn idlers, pads and rollers cause trouble and delay. *Stoody Alloys give the protection where you need it, maintain all-important size!*

CENTRATED WEAR AREAS RECEIVE EXTRA PROTECTION. Bucket sides and bottoms develop distinct wear patterns. A few stringers of hard-metal in these areas slow down effects of wear, equalize overall bucket life.

LESS DOWNTIME—FEWER REPLACEMENTS. Hard-facing usually doubles part life. On specific items, increases up to 3 or 4 times have been noted. *Keeping parts in operation means less downtime for repairs, fewer costly replacements!*

**Why not get the most
from your shovels
by hard-facing now
with STOODY ALLOYS?**

**Available for manual or
automatic welding methods.**

Consult your nearest Stoody Dealer listed in the Yellow Classified Telephone Directory under Welding Equipment & Supplies. He will recommend the BEST Stoody Alloy for your job and provide a list of local job welders having Automatic Welding facilities—or write direct.

TRACK PADS

Shovel parts made with Stoody Self-Hardening 21 are good for double original life.

BUCKETS AND TEETH

Shovel buckets made with hard bonds of Stoody Self-Hardening 21. Shovels catch more, last longer.

HARD-FACED SHEAVES

Any number of applications longer because shovels resist galling. Automatic hard-facing with Stoody 105 does the trick economically—adds many times to life.

IDLERS AND TRACK ROLLS

Old idlers replaced by automatic process using Stoody 105... maintains size and shape, doubles life.

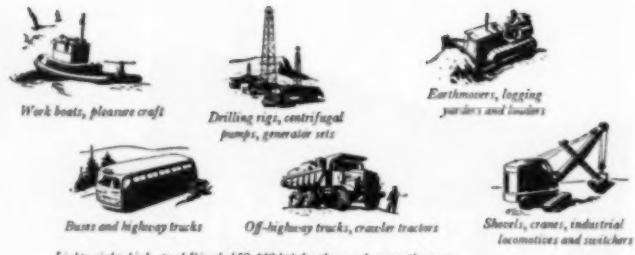
DRIVING TUMBLERS

Old tumblers replaced by automatic application of Stoody Self-Hardening or Stoody 103, out-wear new parts 2 to 1.

STOODY COMPANY

1000 North Main Street, Lancaster, California

**they're
custom-built
to fit the job!**



Lightweight, high-speed Diesels (50-550 hp) for these and many other uses.

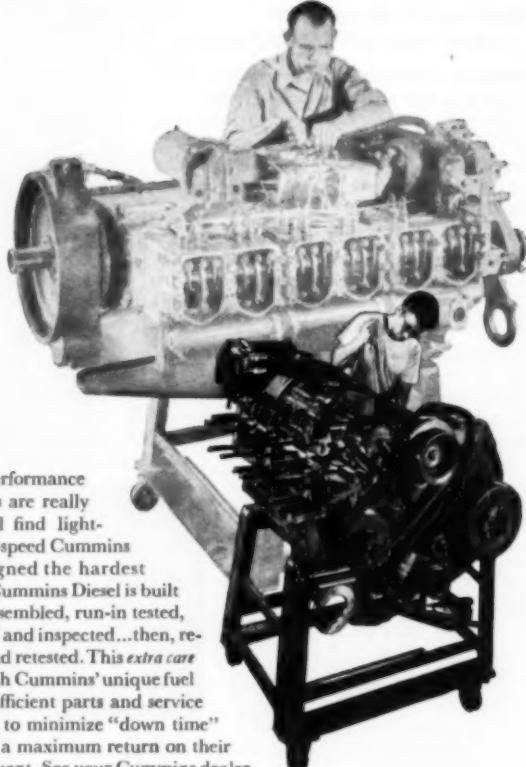
Cummins® Diesels do so many jobs so much better

**they're
*BUILT
NOT
ONCE
BUT
TWICE***



**Diesel power by
CUMMINS**

Wherever performance requirements are really rough, you'll find lightweight, high-speed Cummins Diesels assigned the hardest jobs. Every Cummins Diesel is built *TWICE*—assembled, run-in tested, disassembled and inspected...then, reassembled and retested. This *extra care* combines with Cummins' unique fuel system and efficient parts and service organization to minimize "down time" ... give users a maximum return on their diesel investment. See your Cummins dealer.



CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA
Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: Cumdix

COAL MEN ON THE JOB

AT THE NEWLY OPENED BLUEBONNET MINE of the Leavell Coal Co., Checotah, Okla.: Ellis Taylor, vice president, with his office staff, Miss Virginia Scagno (left) and Miss Christina Stice.

lurgy made by Denver Equipment, probably the best known of a complete line of mill equipment is the Denver "Sub-A" flotation machine, with some 33,000 "Sub-A" flotation Cells now in operation throughout the world, the company reports. In addition to its world-wide network of sales and engineering offices, Denver Equipment has factories in Denver, Colorado Springs, Toronto, London and Johannesburg.

Harold W. Hawkins has been elected vice president and secretary, Joy Mfg. Co., with offices in Pittsburgh. Mr. Hawkins has been with Joy since 1939, serving as secretary, and for a year previous acted as general patent counsel for Joy on a contract basis.

Henry Cain has been named district sales representative in Nebraska, Kansas, Missouri and Southern Illinois for R. G. LeTourneau, Inc., Peoria, Ill. For the past 5 yr Mr. Cain has been LeTourneau's chief representative at the company's Washington, D. C. office.

Baldwin-Lima-Hamilton Corp., Lima-Hamilton Div., Lima, Ohio, has appointed Paul R. Ehrhart, with the company



"ON THE DRILL" BIT SERVICE with Replaceable Blades Eliminates Bit Dressing . . .



There is no such thing as bit dressing when your test drilling is done with Hawthorne "Blue Demon" bits.

Bit service by Hawthorne comes in sturdy, plainly marked wooden boxes, convenient for handling and storing. Factory controlled high quality accompanies every box.

Your "Blue Demon" bit assembly is a principal part of your drilling equipment and is used with many sets of interchangeable, replaceable blades. Each set of "Blue Demon" bits is packed individually in a plainly marked cloth bag. Dull bits are replaceable by a new set of blades, with tools regularly used at the drill, providing "on the drill" bit service at drastically reduced cost.

Use "Blue Demon" Rock Cutter Bits, with replaceable blades, in sizes from 1½" to 10", for COAL, OIL AND MINERALS EXPLORATION . . . TESTING and CORING . . . WATER WELLS . . . GROUTING . . . and FOUNDATION testing.

Drillers the world over are drilling faster, with fewer bit changes, at reduced drilling costs, with long lasting Hawthorne "Blue Demon" Bits.

Use "Blue Demons" for rock bit efficiency at "fish tail" cost.



PATENTS
PENDING

HERB J. HAWTHORNE
P.O. Box 7366
Houston 8, Texas

"W" DENTED SHAKER SCREENS

A "must" when it comes to obtaining an efficient job! Good because the spreading and collecting riffles give uniform spread of material over the entire screen surface . . . turns the top and middle flow of material down in direct contact with the screen . . . gives an increased screening efficiency up to 33% on fine sizes over an undented flat screen.

Comes in Carbon and Stainless Steels and Manganese Bronze. No sag.

Write us today. We shall reply promptly.

REMALY
MANUFACTURING CO., INC.
TAMAQUA, PA.

Built for long service . . .

Shaker Conveyor Troughs and Ball Frames



The special high carbon steel of which Hendrick Shaker Conveyor Troughs are made, offers great resistance to abrasion and to bending or breaking under weight of the coal. The sides of the troughs are so shaped that they give maximum resistance to buckling.

Standard lengths are 10 feet, and 10 feet, 2 inches, but can be furnished in any desired length up to 13 feet, 2 inches.

Hendrick Ball Frames give troughs substantial support whatever the floor conditions. Write for full information.



Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitsco Open Steel Flooring,
Shur-Site Treads, Armorgrids

HENDRICK Manufacturing Company

41 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

ATLAS LOCOMOTIVES HAVE THAT EXTRA



7-Ton
Storage battery locomotive

ATLAS STORAGE BATTERY LOCOMOTIVES will do more work on one charge of the battery than any S-B Locomotive of the same weight and battery capacity.

These Atlas Locomotives include every known feature contributing to:

LOWER OPERATING COSTS—LOWER MAINTENANCE COSTS

Equipped throughout with anti-friction bearings. Also Atlas Double Reduction Spur Gear Drive.

Series parallel—Split Field Control.

ATLAS ENGINEERING SERVICE — IS ALWAYS AT YOUR SERVICE
Complete details and specifications on request.



THE ATLAS CAR & MFG. CO.

since 1931, assistant to the resident vice president. In addition, he also will serve as sales manager in charge of all sales of shovels of 3-yd capacity and larger. J. W. Hardesty, formerly district manager of the territory including Northern Ohio, Indiana, Illinois, Michigan, Missouri and Kansas, has been appointed sales manager of small shovels and cranes, up to and including a 2½ yd capacity. Bob Drumm has been appointed a representative in Kentucky, Southern Ohio, and West Virginia, with headquarters in Louisville, Ky. He was formerly employed in the sales department of the Emmett C. Watson Co., Louisville. R. W. Head has been appointed district manager of the Southwest territory, which includes New Mexico, Oklahoma and Texas, with headquarters in Dallas. He succeeds R. A. Otersness, who has become sales manager for Contractors Equipment & Supply Co., Lima distributor in Albuquerque, N. M.

Cummins Engine Co., Inc., Columbus, Ind., has announced that Raymond H. Snyder, former president and treasurer, Snyder Aircraft Div., Air Associates, Chicago, has purchased certain assets of the Chicago operation of Cummins Diesel Sales Corp. and will operate the Chicago facilities as an independently owned Cummins dealership with the new company name of Cummins Illinois Engine Sales, Inc. Cummins operations at Milwaukee, Wis., and Peoria, Ill., formerly with headquarters at the Chicago dealership, now will operate as individual dealerships of Cummins Diesel Sales Corp. E. E. Sandtner is the newly appointed manager of the Peoria territory, and R. R. MacDonald has been promoted from acting manager to dealership manager at Milwaukee. Central and Eastern portions of Iowa, with the exception of Scott County, Iowa, have been transferred to Cummins Diesel Sales Corp., with headquarters at Omaha, Neb., under W. D. Blizzard, manager.

William M. Wallace has been appointed an assistant to the vice president of Allis-Chalmers general machinery division. With the company since 1937, Mr. Wallace has been special assistant to G. V. Woody, manager of the company's processing-machinery department, since 1947.

William H. McAllister, formerly district manager in Memphis, has been appointed district manager, Car Wood Industries, Findlay Div., for the Texas, Oklahoma and New Mexico territory. Guilford E. Koehler has been named district manager at Memphis, succeeding Mr. McAllister.

Gould-National Batteries, Inc., Trenton, N. J., has appointed George F. Walsh sales promotion manager. For the past 4-yr, Mr. Walsh held a similar post with the Baldwin-Lima-Hamilton Corp. at Eddystone, Pa.

N. A. Hamilton has been named general manager of the newly created Explosives Div., Olin Industries, Inc., with headquarters at East Alton and plants

NEW *American* HEAVY-DUTY 30-S CRUSHER



- ✓ Crushes ROM Coal
Rock, Slate, Sulphur Balls,
and Gob... without oversize
- ✓ Saves Labor Costs
of Pickers
- ✓ Saves Coal

THE HEAVY-DUTY *American* PAYS OFF FOR THESE 3 MINES:

- **CRESCENT COAL CO., Central City, Ky.** "We have not spent a cent on this crusher since installation," writes the General Manager. It has eliminated two pickers... recovers coal previously thrown away on account of impurities. By crushing and washing, this coal is salvaged. Estimated average of 280 tons of coal and "gob" go through crusher every day. "In 18 years' experience with American Crushers, we know it is the most economical and ideal crusher for our operation."
- **PERRY COAL CO., O'Fallon, Ill.** Previous crusher required three men at the picking table, according to the Mine Superintendent. Today, only one operator is needed to remove wood and tramp metal. No replacement parts have been needed... recent inspection showed no signs of wear after 16 months' operation at a daily operation of 210 tons for 7" plus ROM coal. This Heavy-Duty American is one of five Americans installed at this mine.
- **SOUTHWESTERN ILLINOIS COAL CO., Percy, Ill.** "The Mine reports that the installation of the American Pulverizer #30-S crusher has been an excellent labor-saving device. In the 12 months of operation the crusher has had no parts replacements. Continued inspection and past American Crusher history indicate the maintenance of this crusher will be a very small item. Approximately 320 tons of coal per day go through this crusher."

● Let American show you how you can profit by a 30-S Heavy-Duty installation. We welcome your inquiries.

American PULVERIZER COMPANY

Originators and Manufacturers of
Ring Crushers and Pulverizers

1119 MACKLIND AVE.
ST. LOUIS 10, MO.

The STAMLER Hydraulic CAR SPOTTER
(Pat. Pend.)



**THE ANSWER TO YOUR
TRIP MOVING PROBLEMS**

This car spotter with its ease of installation and record of increased tonnage at inside loading points is also proving very desirable for permanent installations where its **LOW INSTALLED COST** and **FREEDOM FROM MAINTENANCE** are unequalled.

May we discuss its application to your needs.

THE W. R. STAMLER CO.
PARIS, KENTUCKY

**CONTROL Your Water Problems
with the Flood City
PLUNGER PUMP**



This pump is made of high-grade semi-steel with a large cover to facilitate inspection. All moving parts are completely self-lubricating. Inter歇性 shell runs on adjustable roller bearings. Furnished V-Belt or Gear Drive. Size 3 x 8, Capacity, 100 gpm. per minute, 3" suction and 3" discharge.

This pump uses the leak-proof, cold-resistant FLOOD CITY REVERSIBLE WATER END—standard for replacement purposes in large and small coal mines. Write for more information on this and other Flood City Mining Equipment.

Flood City Brass & Electric Co.

Messenger and Elder Streets · JOHNSTOWN, PA.
Branch Office: 4 Virginia St. W., Charleston, W. Va.

in various parts of the country. Mr. Hamilton will have full responsibilities for all operations of the fully integrated division.

New York Belting & Packing Co., Passaic, N. J., has named Carl G. Link Jr., formerly Chicago factory representative, northern district sales manager, covering the states of Iowa, Indiana, Illinois, northwestern Pennsylvania, northern Ohio, southern Wisconsin and northern New York, with headquarters in Chicago. William I. Butler, formerly factory representative in Memphis, has been made district sales manager for the southeastern section of the country from the Mississippi to the Atlantic Coast, with headquarters in Memphis. Frank E. Cavanaugh has been added to Mr. Link's staff as a factory representative in the northeastern district. Joseph Van Schaik, formerly with the home office in Passaic, has been named factory representative in the Rocky Mountain states, with headquarters in Denver.

Dr. Robert W. Lawrence has been named manager of explosives development, Hercules Powder Co., Wilmington, Del., succeeding C. H. Cordie, who retired recently after a long career in the department. Active in explosives research for more than 15 yr, Dr. Lawrence joined Hercules in 1929 and was named assistant manager of explosives development last year.

Flexoid Conveyor Co. has been recently formed as a division of the Smith Power Transmission Co., Cleveland, and will develop, design, construct and install conveyor equipment for diversified industries. The new company will draw on Smith Power's 27 yr of experience in the design and application of power-transmission equipment. Stiles C. Smith III is president of both companies.

Allis-Chalmers Mfg. Co., Tractor Div., has announced the purchase of 12 acres of land in Independence, Mo., and plans for immediate construction of a new and modern factory branch to serve agricultural and industrial dealers in Eastern Kansas and Western Missouri. According to Willis G. Scholl, vice-president and general sales manager of the Tractor Div., the facilities will replace the Kansas City branch and will employ the most modern methods and equipment to expedite customer needs for machinery and repairs, maintaining a complete stock of repair parts and accessories.

Dow Corning Corp., will invest over \$13,000,000 in a major expansion of plant capacity for its silicone products, it has been announced by Dr. W. R. Collings, vice president and general manager. The new plant facilities are considered essential to the national defense and are designed to assure an adequate supply of silicone materials for the armed services and defense-supporting industries. Construction is already underway and the program is scheduled for completion by 1954.



"Carlon is easier to Install"

"We save time with CARLON pipe because it's easier to install. Long lengths require fewer fittings and, since the pipe is flexible, we can bend it around curves to eliminate many connections needed with other types of mine pipe."

CARLON plastic pipe can be installed promptly wherever needed, either for emergency service or for permanent use. Lightweight and flexible, it is handled easily in long lengths without materials handling equipment. It conforms to irregular surface contours and curving slopes and entries.

Guaranteed against rot, rust and electrolytic corrosion, CARLON plastic pipe has a trouble-free service life many times longer than ordinary pipe. It is unaffected by sulphurous waters, alkalies, metallic salts and other corrosive wastes. Smooth internal surface will not accumulate scale.

NOM. SIZE	O.D.	I.D.	EST. BURST P.S.I.	WT. LBS. PER FT.	SHPO. LENGTHS
1/2"	0.840	0.622	540	0.103	400 ft. coils
5/8"	1.030	0.824	350	0.140	400 ft. coils
1"	1.310	1.070	200	0.181	300 ft. coils
1 1/8"	1.660	1.380	200	0.267	300 ft. coils
1 1/2"	1.900	1.610	200	0.320	230 ft. coils
2"	2.378	2.070	170	0.445	200 ft. coils
2 1/2"	2.875	2.469	170	0.680	200 ft. coils
3"	3.504	3.070	165	0.910	100 ft. coils
4"	4.504	4.030	150	1.250	25 ft. str.
6"	6.630	6.070	115	2.230	25 ft. str.

Specify the Pipe with the Stripe!

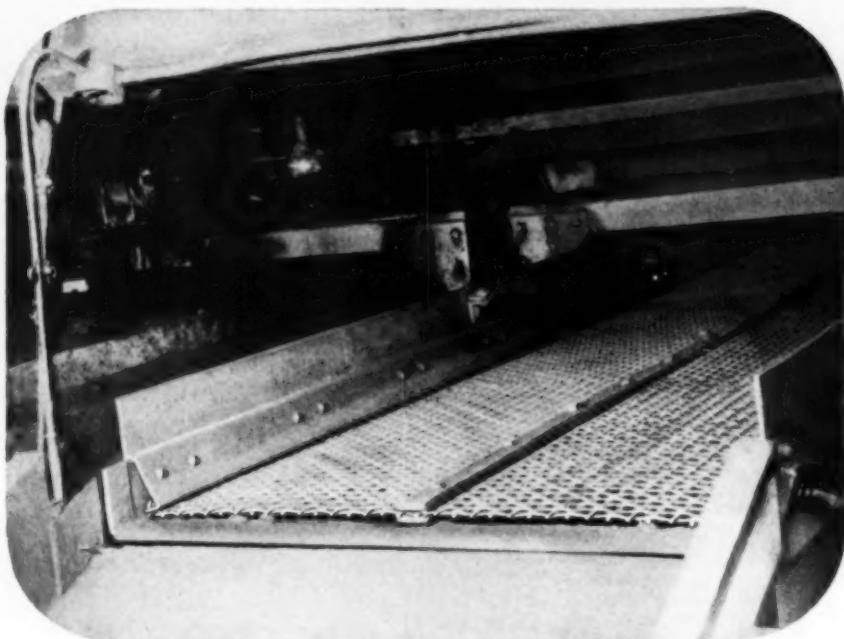
Write today for catalog ♦



CARLON PRODUCTS CORPORATION

In Canada: Micro Plastics, Ltd., Acton, Ontario
10300 Meech Avenue • Cleveland 5, Ohio

AGGREGATE SCREENS



Our customers report that ROETEMP-ROEFLAT gives up to 315% more wire screen life

PROBABLY the first thing to say about Roebling Wire Screens made with ROETEMP wire...woven in the ROEFLAT construction...is that they stay on the job a whole lot longer. ROETEMP is an oil-tempered wire with high resistance to abrasion. ROEFLAT is the construction where the wires lie flat except at the short crimps...This harder, tougher wire, plus 75% more wearing surface, gives you far longer screen life...slashes your screening costs.

But ROETEMP-ROEFLAT has still more advantages. Its smooth, level surface causes less clogging

and blinding than ordinary screens. Its precision openings provide more uniform grading and top screening efficiency.

ROETEMP-ROEFLAT can be made in almost any type of construction, such as ROETON and ROESLOT with openings of $\frac{1}{4}$ inch and up and square space with openings of $\frac{1}{8}$ inch and up...Before ordering screen again, find out what ROETEMP-ROEFLAT will bring you in new efficiency and savings. Woven Wire Fabrics Division, John A. Roebling's Sons Company, Roebling, New Jersey.

ROEBLING

WRITE TO
WOVEN WIRE FABRICS DIV.
JOHN A. ROEBLING'S SONS
COMPANY
ROEBLING,
NEW JERSEY



Here's a Boom That REACHES For Extra Jobs



The all-hydraulic 3 ton Bucyrus-Erie Hydrocrane, with telescoping boom, reaches into windows, doors and box cars . . . over fences . . . under beams . . . between wires and beams — without moving crane an inch! Boom extends and retracts a distance of eight feet.

The outstanding advantages of telescoping boom plus precision hydraulic control combine to make the Hydrocrane ideal for placing conveyor machinery in shaft cage — unloading freight cars — dismantling and erecting machinery — clean-up around tipple tracks — cleaning out mine cars — and handling mine timbers. A special hydraulic grapple picks up and sets down mine timbers without

assistance — eliminates need of helper who handles chain and crane hook.

Here's a crane that fills the bill on dozens of surface jobs around the mine. It squeezes into close quarters — operates by cushion smooth hydraulic power — is controlled entirely by hand levers, no tricky foot work.

Write now for full details or see your Hydrocrane distributor.

15RH52

**BUCYRUS
ERIE**
HYDROCRANE

Every crane function fully hydraulic —
boom hoist, load hoist, swing, boom
telescope, outrigger set and retract
bucket closed.



Owners report 33 percent faster shaft mucking, 30 percent less manpower with new Hydromucker. Here's a fast mechanized way to remove muck in shaft sinking work — the Bucyrus-Erie Hydromucker. Heart of unit is a hydraulically operated clamshell bucket specially designed for close quarter work. Other components include hydraulic pump, electric motor and control bonnet. Bucket loads material from shaft floor to skip, car or other suitable conveyor for removal to surface.

Bucyrus-Erie Hydrocrane Division
South Milwaukee, Wisconsin



Collyer
Twin Parallel
Type G
Mining Cable

For samples of Collyer Mining Cables and recommendations, write Collyer Insulated Wire Company, 245 Roosevelt Ave., Pawtucket, Rhode Island.



New Books for Coal Men

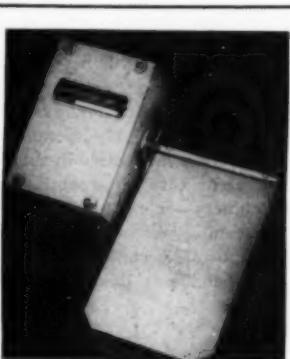
Bureau Reviews Safety

Federal Coal-Mine Inspection—A Decade of Progress, Annual Report for Fiscal Year 1951 and 10-Year Review, by J. J. Forbes, M. J. Ankeny and H. F. Weaver. Here's the story of the federal government's efforts to improve coalmine safety since passage of the Coal-Mine Inspection Act of 1941. The Bureau reviews safety accomplishments and cites obstacles met in improving the record. Among its other contributions to safety, the Bureau cites the introduction of roof-bolting. *USBM, I.C. 7625. 47 pp. 8x10½-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

How Industries Use Fuels

An Economic Study of Fuels in Manufacturing, by W. H. Voskull. This study, based on the Census of Manufacturers from 1909 to 1947, shows quantities and kinds of fuel used by industries and industry groups, gives data on the role of electric power and the cost of various fuels, and discusses the competitive trend among fuels. *Illinois Geological Survey, R.I. 157; University of Illinois Engineering Experiment Station, Circular Series No. 63. 28 pp. 6x9-in; paper. No price quoted. Illinois Geological Survey, Urbana, Ill.*

More books on p 191



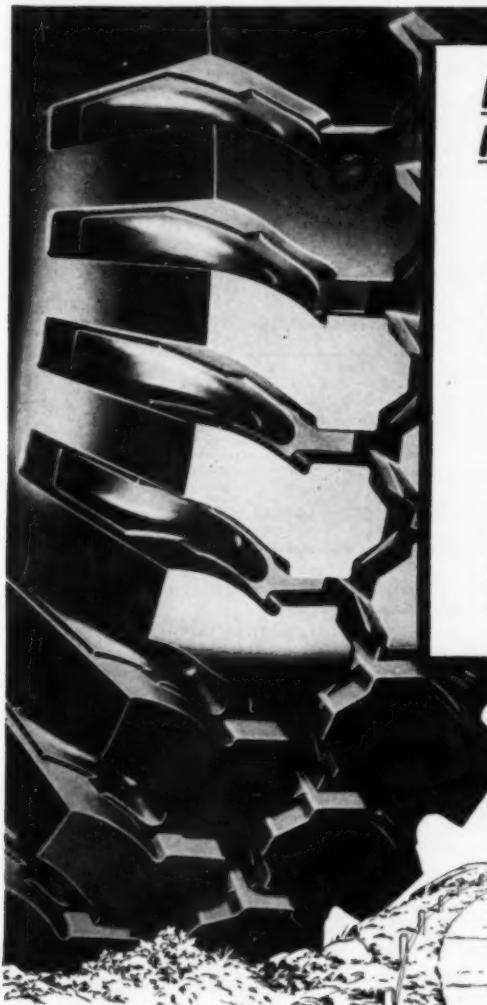
AIRFLOW INDICATOR SWITCH

Here's a dependable mercury tube type switch to be used with battery and bell to sound an alarm in the event of ventilating fan failure. Switch is also available for 110 or 220 volt A.C. and can be used with either light, bell or horn. . . . The switch is designed for installation in the exhaust air flow of fan. . . . Write for full descriptive bulletin.

GUYAN
MACHINERY COMPANY
LOGAN, WEST VIRGINIA

U.S. ROYAL

FLEETMASTER Truck Tire



More mileage on the highway
More traction off the road!

Licks toughest on-off-road problems! Combines smooth, long-wearing roll on the highway with sure traction through mud, sand, rocks. Actually saves up to 70% of your tire costs! Remember the name—U. S. Royal Fleetmaster—tire specialist for truck-work on and off the road!

These facts can save you money!

- Longer wear—70% deeper traction tread!
- More safe mileage—more rubber on the ground!
- Less surface-shock—thicker under tread!
- More cut-resistance—job-fitted tread compounds!
- More recaps—tougher, round-molded carcass!

SEE AND COMPARE the Fleetmaster at your U. S. Royal Dealer's. Phone him today—he's in the Classified Telephone Book.

ONE TIRE DOES TWO JOBS!

ON THE ROAD

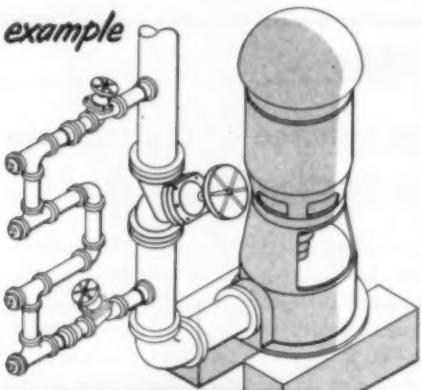
OFF THE ROAD

UNITED STATES RUBBER COMPANY
COAL AGE • March 1952

How's This For Solving a Valve Problem

...on Corrosive Well Water,

for example



THE INSTALLATION

On outlet of well water pump supplying plant of Barr Rubber Products Co., Sandusky, Ohio. Sulfur content of water extremely high.

THE HISTORY

Valves formerly used here lasted no more than 6 months. Under constant exposure to severe erosive and corrosive effects, they failed to provide the easy operation and positive seating needed in this service. They required excessively frequent re-packing and seating maintenance.

Problem solved by replacing with Crane Packless Iron Body Diaphragm valves in main line and bypass. Installed more than a year, they show no corrosion, no effects of service. Operate smoothly, seat tightly, with no maintenance needed to date.

VALVE SERVICE RATINGS

SUITABILITY:

Just what was needed

MAINTENANCE COST:

None to date

CORROSION-RESISTANCE:

No evidence of corrosion

SERVICE LIFE:

Outlasted any 2 other valves so far

OPERATING RESULTS:

Pump shutdowns for valve repairs stopped

PRICE:

Much less than alloy valves

AVAILABILITY:

Stock item in Crane line

THE VALVE

Crane No. 1611 Iron Body Packless Diaphragm Valves featuring separate disc and diaphragm. No packing to maintain; no stem leaks. Neoprene diaphragm used to seal bonnet only. Independent disc with neoprene insert insures positive seating even should diaphragm fail. Also fully neoprene lined valves. Many common and corrosive services. See your Crane Catalog or Crane Representative.

The Complete Crane Line Meets All Valve Needs. That's Why,

More Crane Valves Are Used Than Any Other Make!

CRANE • VALVES

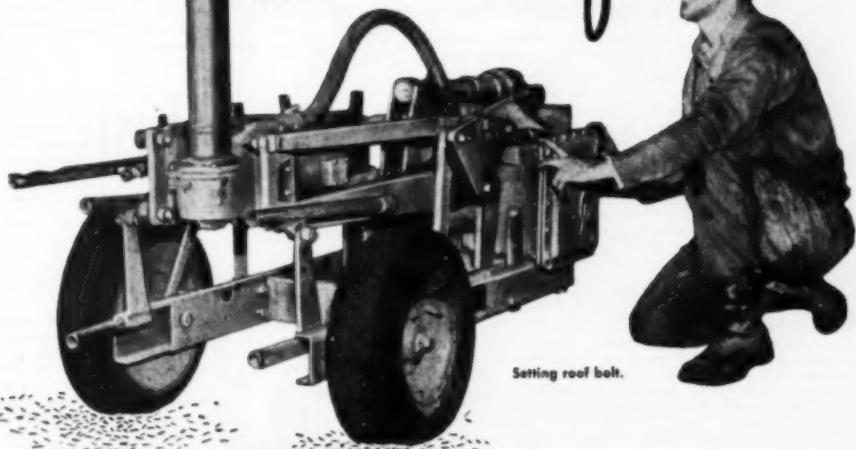
CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING



100

bolts a shift



Setting roof bolt.



Drilling hole for suspension roof bolt.

In the 48-inch Harlan seam, in an eastern Kentucky mine, the CP MOBILE ROOF-BOLTING UNIT is drilling 42-inch holes and setting 100 roof bolts a shift.

In other mines where holes are drilled to a depth of 48 inches, the average is 70 to 90 bolts a shift. With some 30-inch and 36-inch holes the complete job is being done in less than two minutes a hole.

**Some important features of
CP Mobile Roof-Bolting Unit**

One motor drives both auger and bolt-setter.

No repositioning of unit is necessary for removal of auger and substitution of bolt-setting socket.

Wheel locks hold unit in position during drilling and bolt tightening.

Built-in slip clutches protect the drill and bolt-setting motor, and the feed motor from stalling.

Telescopic chuck permits adjustment of auger to compensate for roof irregularities to 10 inches, and also enables operator to bottom extra deep holes without using additional auger lengths.

Write for copy of SP-3006



PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

The plain hard facts prove you save with **CHEVROLET** Advance- Design **TRUCKS**

FACT No. 1

MORE TRUCK FOR LESS MONEY

Compare the list price of a Chevrolet truck with that of any other truck built to handle the same payloads. You'll find the Chevrolet truck lists for less, yet brings you ruggedness, stamina and great truck features you won't find in many trucks costing much more.

FACT No. 2

ROCK-BOTTOM OPERATING COSTS

Dollar-for-dollar comparisons prove that Chevrolet trucks cost least to own and maintain. Valve-in-Head economy saves on gas, in the 105-h.p. Loadmaster or 92-h.p. Thriftmaster engines. Four-way engine lubrication reduces wear and oil costs. Rugged construction means long life.

FACT No. 3

ENGINEERED FOR YOUR LOADS

Every Chevrolet truck is factory-matched to payload and service requirements. You don't have to buy

more truck—or settle for less truck—than you need for your loads. Frame, axles, springs, body, brakes and power are balanced for the job.

FACT No. 4

LOWER, SLOWER DEPRECIATION

Records show that Chevrolet trucks traditionally bring more money at resale or trade-in than many other makes. Chevrolet's market value stays up because the value stays up! Here is important and convincing proof that Chevrolet is the best truck buy!



CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth

shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-

duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN



Investing Your Money

Tax-Sheltered Investments, by W. J. Casey and J. K. Lasser. With federal and other taxes taking the big bite on your income, how can you put your money where it will cost you least to keep it? This volume may be helpful since it explores the various investment areas in terms of the new tax laws. 138 pp. 8½x11-in.; looseleaf; imitation leather. \$12.50. Business Reports, Inc., 225 West 34th St., New York 1, N. Y.

Making Gas Underground

The Process of Underground Electro-carbonization, by J. D. Forrester and Erich Sarapuu. Results of over 4 yr of experimentation show that it is possible and probably economical to gasify coal underground by passing an electric current through the bed. This booklet tells what the University of Missouri School of Mines and Sinclair Coal Co. found out in the laboratory and at the Tiger mine, Hume, Mo. Missouri School of Mines, Rolla, Mo. Technical Series No. 78. 84 pp. 6x9-in; paper. No price quoted.

Other Books and Booklets

Studies of the Extraction and Coking of Coal and Their Significance in Relation to Its Structure, by M. Orchin, C. Columbic, J. E. Anderson and H. H. Storch. USBM Bulletin 505. 20e. Supt. of Documents, Government Printing Office, Washington 25, D. C.

Carbonizing Properties: Chilton Coal From Lorado N. 5 Mine, Lorado, Logan County, W. Va., by J. D. Davis, D. A. Reynolds, D. E. Wolfson, W. H. Ode and B. W. Naugle. USBM Bulletin No. 500. 25e. Supt. of Documents, Government Printing Office, Washington 25, D. C.

The following publications by the U.S. Bureau of Mines are available free upon request to the Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8x10½-in; paper; mimeo.

Water Infusion of Coal Pillars Before Mining, Kenilworth Mine, Independent Coal & Coke Co., Kenilworth, Utah, by E. O. Jackson and W. M. Merritts. R. I. 4836.

Preparation Characteristics of Coal From Somerset County, Pa., by W. L. Crentz, A. L. Bailey and J. W. Miller. R. I. 4834.

Flammability of Mixtures of Individual Paraffin-Hydrocarbon Gases With Air and Added Nitrogen at Subatmospheric Pressures, by G. S. Scott, M. G. Zabetakis and A. L. Forno. R. I. 4839.

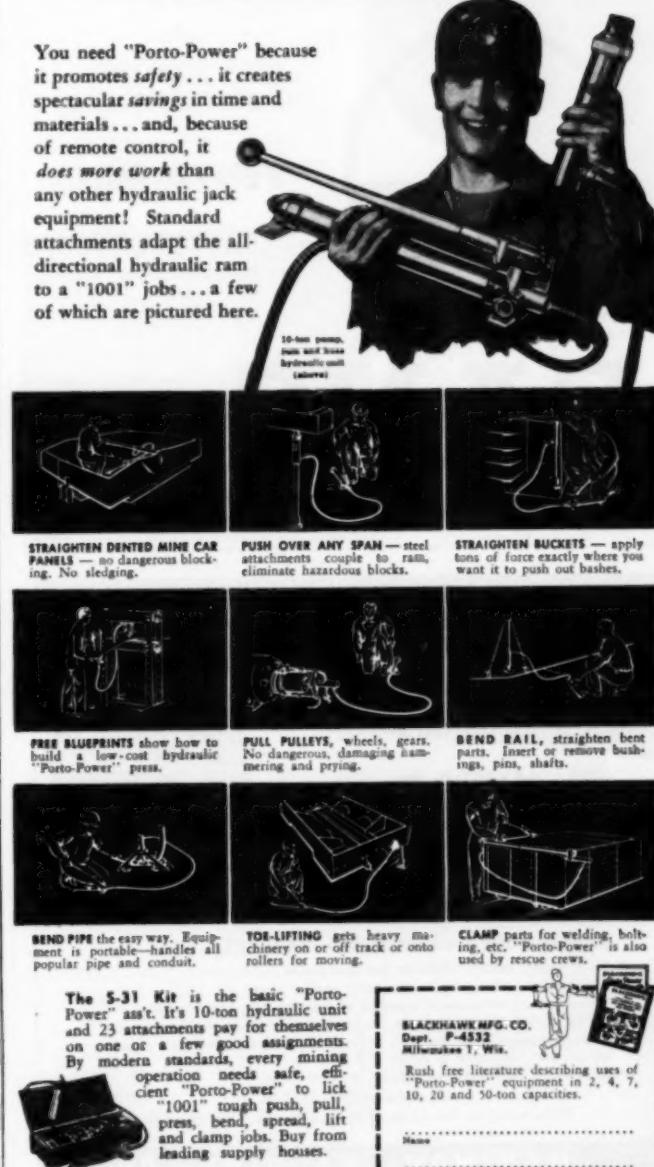
Estimate of Known Recoverable Reserves of Coking Coal in Jefferson County, Pa., by J. W. Dowd, A. L. Toenges, R. F. Abernethy and D. A. Reynolds. R. I. 4840.

Modern Automatic Electrically Controlled Elevators for Transporting Men at Two Coal Mines in Western Pennsylvania, by J. W. Holcomb. I. C. 7628.

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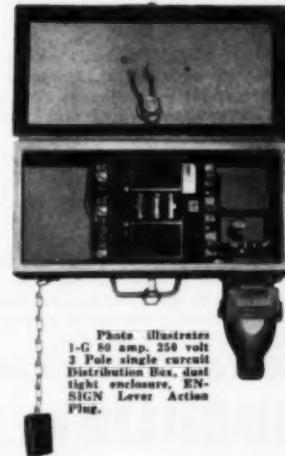


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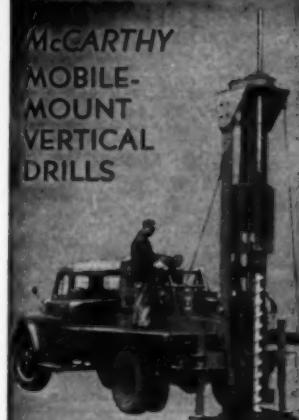
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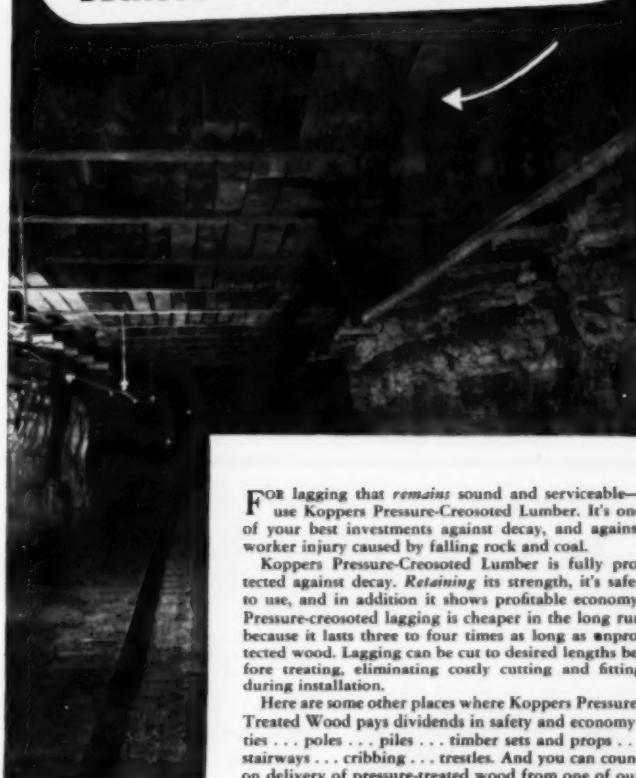
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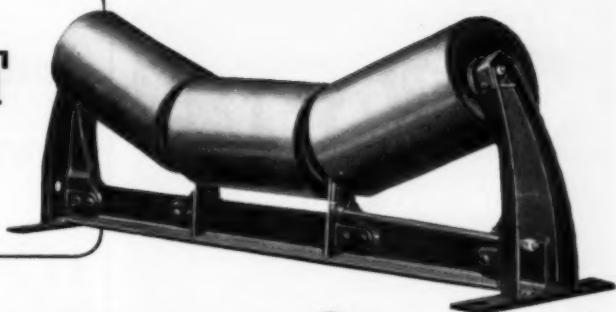
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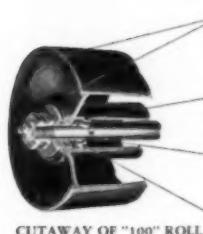
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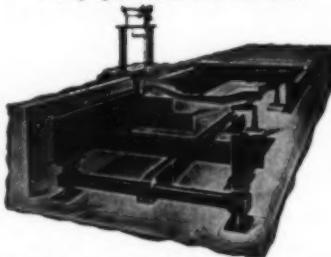
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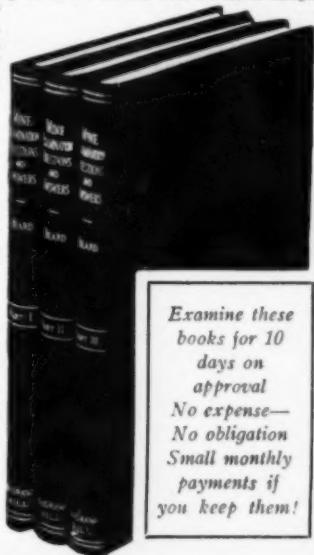
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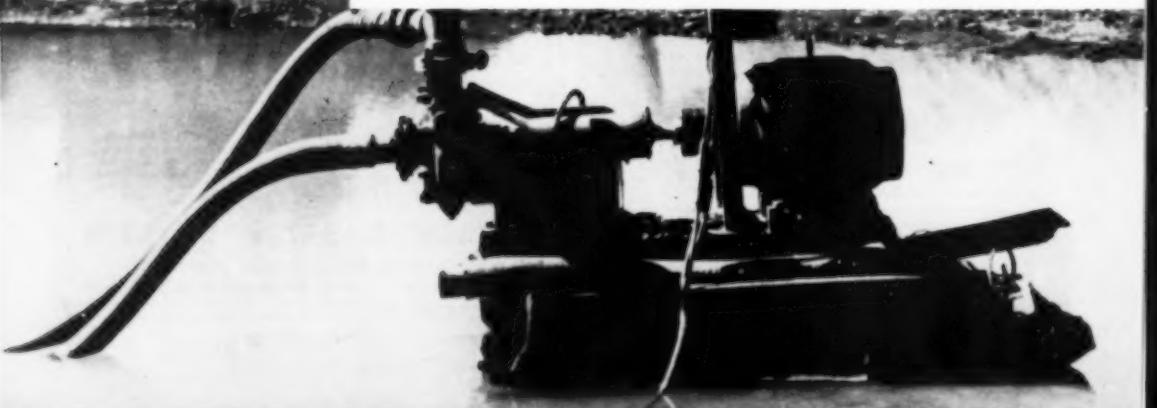
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750 KW G.E. 250 V. 7200 R-Syn.-6K 2300/4000	13 Ten Jeff 250 v. 38/48" Gs.
300 KW West. 250 v. 1200R-Syn. 2300	14 Ten Jeff 250 v. 38/48" Gs.
300 KW West. 275 v. 1200R-MPC-ATT 2300/4000	15 Ten Jeff 250 v. 38/48" Gs.
300 KW West. 275 v. 1200R-Syn. 2300	16 Ten Goodman 250 550 v. 42/48" Gs.
300 KW West. 250 v. 1200R-Syn.-BK 2300	8 Ten Westing. 250 v. 38" Gs.
200 KW West. 250 v. 1200R-Syn.-BK 2300	9 Ten Westing. Belts 250 v. 44" Gs.
200 KW G.E. 225 v. 1200R-MPC-ATT 2300/4400	5 Ten Greensburg Bat. Linc.-Phila. Bat.
200 KW G.E. 275 v. 1200R-Syn.-BK 2300	4-5 Ten Goodman 30B 250 v. 42/44" Gs.
150 KW West. 275 v. 1200R-Syn.-BK 2300	35 Ten Goodman 250 v. 42/44" Gs.
150 KW G.E. 350 v. 900R-DLC-ATT 2300	12 G3 Goodman Sheaves 250 v. 38/39
100 KW G.E. 275 v. 1200R-Syn.-BK 2300	33BB Jeff. A.C. permissible
100 KW G.E. 275 v. 1200R-KT-RC 2300	
50 KW G.E. 125/250 v. 1200R-KT-RL 220	

ROTARY CONVERTERS

2-500 KW G.E. 275 v. 1200R-Syn. 4000	490 G.E. 450 MT S.R.
2-500 KW G.E. 275 v. 1200R-Syn. 4000	300 G.E. 450 IM S.R.
300 KW G.E. 275 v. 1200R-Syn. 4000	150 G.E. 450 ATI Syn.
300 KW West. 275 v. 1200R-Syn. 4000	2-100 G.E. 450 IM S.R.
300 KW West. 275 v. 1200R-Syn. 4000	100 West. 450 MT S.R.
300 KW West. 275 v. 1200R-Syn. 4000	100 West. 1200 CS S.R.
300 KW West. 275 v. 1200R-Syn. 4000	75 West. 900 CS S.R.
300 KW West. 275 v. 1200R-Syn. 4000	100 West. 1750 KT S.C.
300 KW West. 275 v. 1200R-Syn. 4000	50 G.E. 900 KT S.C.
300 KW West. 275 v. 1200R-Syn. 4000	50 A.M. 1200 AR S.C.
300 KW West. 275 v. 1200R-Syn. 4000	50 G.E. 900 KT S.C.
300 KW West. 275 v. 1200R-Syn. 4000	40 G.E. 900 MT S.R.
300 KW West. 275 v. 1200R-Syn. 4000	30 G.E. 900 KT S.C.
300 KW West. 275 v. 1200R-Syn. 4000	30 G.E. 1200 KT S.C.
300 KW West. 275 v. 1200R-Syn. 4000	20 West. 1200 CS S.C.

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1-147 C.P. 100 ft. portable Imperial Basic Model

23-B. Late Type. 30 HP 230 V. DC

23-B. Late Type. 30 HP 230 V. DC

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25 (2)	C. Wh.	SM	525	230
150	C. Wh.	SM	430	230

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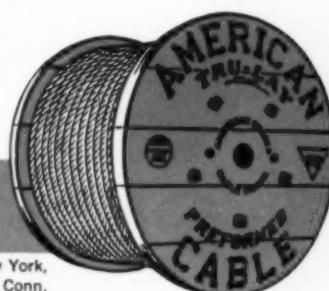
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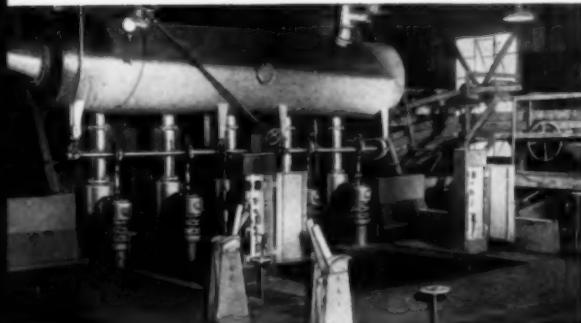


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LINK-BELT manufactures three coal cleaners . . . and all three remove foreign matter from coal with top efficiency, effectively separate slate, rock, bone.

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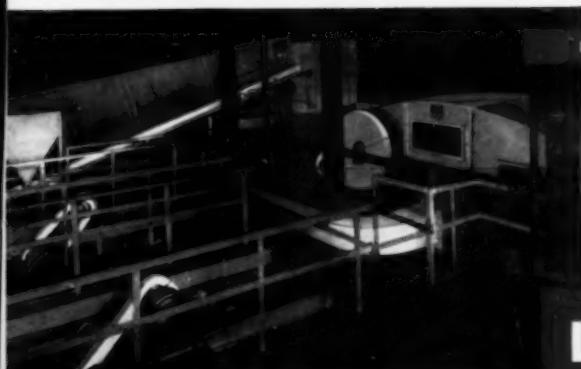
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Float-Sink Concentrator—Latest advance in coal cleaning—utilizes Heavy-Media* separation process. Efficient for extremely high or low specific gravity separation . . . when a large percentage of coal is near the separating gravity . . . when amount of impurities in feed fluctuates or product must be quickly changed. Cleans larger sizes, reducing necessity for manual picking.

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St. Louis 1, Atlanta 1, Memphis 1, Portland 1,

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